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Mineral Waters of India

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In view of the large number of mineral springs in India it is pertinent to ask why their therapeutic and commercial possibilities have not been better developed. Occasional references to a particular spring may occur in a newspaper but this is almost invariably because of religious or traditional interest ; occasionally one may light upon a little known spring and seek information regarding its properties, as for instance I found a letter in a recent number of the *Indian Medical World* by DR. SUNDARI MOHAN DAS making inquiries regarding certain hot springs at Bhagalpore. We know that the subject has not escaped the attention of the Geological Survey, but no attempt seems to have been made to awaken any great public interest either in regard to the medical or commercial properties of the mineral waters found in India.

It is, therefore, a matter of congratulation, that the All India Medical Conference held at Poona last April took the initiative and recommended that "This Conference is of opinion that as many mineral and thermal springs exist in various parts of India, the Government of India should appoint a Committee to investigate and suggest how they can be utilised and developed to greater advantage." If a precedent or analogy were wanted for their resolution, it is to be found in the Committee for the study of Hydrology in Great Britain, where it is felt that the interests of both patients and doctors and also "the reputation of the spa or even of balneotherapy generally" suffer owing to rival claims. But this is not all, for the Committee is also intended to provide opportunities for students and medical practitioners to study the subject and to define more precisely the usefulness of hydrology as a mode of treatment, and the different spas and their waters in particular, through the medium of scientific research. A similar investigation and steps are suggested for India.

It is perhaps well to define "Mineral Waters" at this juncture.

There is no sharp line of demarcation between "Mineral Waters" and waters of ordinary character. Rain water, charged with carbonic acid, percolates through the soil or through relatively thin layers of rock and emerges with a moderate load of dissolved impurities. Upon evaporation such waters give a residue consisting most commonly of calcium carbonate, calcium sulphate, or silica, with minor amounts of alkaline chlorides and blending with rain or sewage waters, they form the beginnings of streams. Sometimes sulphates predominate, sometimes carbonates but chlorides are present much less conspicuously. Calcium is the dominating metal and sodium occupies as a rule, a subordinate place. To the vast majority of spring waters, these statements apply, but here and there exceptions are encountered which by their peculiar characters, attract attention and are known as "Mineral" Wells or Springs. The term mineral spring is restricted to waters of abnormal or unusual composition and mineral water could be defined as merely a water which differs either

in composition or in concentration from the common potable varieties.

A mineral spring may be described as one which owes its character to local as distinguished from wide spread or general conditions ; and the peculiarities thus acquired may result from a great variety of causes. One water, rising from beds of salts, is charged with sodium chloride ; another represents the solution of gypsum $CaSO_4$ $2 H_2 O$, a third may carry substances derived from the sulphides of metalliferous veins, and so on indefinitely.

Any soluble matter existing in the crust of the earth may find its way into the water of a spring and give to the latter some distinguishing peculiarity. Even in their gaseous contents spring waters differ widely. Some are heavily charged with carbonic acid and effervesce upon reaching the air, and others contain hydrogen sulphide in sufficient quantities to be recognised by the smell. Some waters are strongly acid, some alkaline, and some neutral. Waters emerging from beds of pyretiferous shale are often rendered astringent by salts of aluminium or iron ; in short every difference of origin may be reflected in some peculiarity of composition or character.

There are quite a large number of mineral and hot springs scattered over different parts of India, but they are almost totally neglected and nothing is done for their commercial exploitation. A list of the mineral waters and the thermal springs in India which has been very kindly compiled for me by my friend MR. AUSTIN GHOSH of the Geological Survey of India is given in the appendix to this article, and I take this opportunity to express my best thanks to Mr. GHOSH for the labour involved in the compilation.

Natives of India have for many ages recognised the value of mineral waters and of hot springs, which are often charged with more than usual quantities of mineral matter. In many cases these, like most unusual natural phenomena, have been held sacred by the Hindus, and have consequently become places of resort for pilgrims from great distances. As instances of this sort may be mentioned the hot springs at Mani Karu in Kulu, where pilgrims cook their rice in the hot springs emerging from the shingle beds close to the ice-cold stream of the Parbati river. The hot water is also led into the neighbouring temple and rest houses for baths, they are reputed to be efficacious in cases of rheumatism.

At Lasundra in the Kaira district, and at Vajrabai in the Thana District, Bombay Presidency, springs of sulphurous water having a temperature of 115° F are also resorted to by Hindu pilgrims. Generally, it may be said that hot springs, often sulphurous, are common through the tertiary areas of Sind and Beluchistan on the one side, and of Assam Burma on the other side of India, the distribution being similar to the distribution of petroleum, with its constant associates of salt and gypsum. Other springs occur along the foot-hills of the Himalayas, in the Kharakpur hills etc, sufficiently well distributed to permit of easy transport.

The springs at the Jawalamukhi in the Kangra district contain bromide and iodide of sodium and potassium ; the water is said to be a remedy for goitre. The provincial gazetteers contain sufficient references to these springs, to guide private enterprise. The mineral water of Sitakund in the Kharakpur hills is the only one which has been turned to account ; this has some reputation in Bengal as table water. An investigation into the radio-activity of the thermal springs of the Bombay and Madras Presidencies was undertaken by Rev. DR. A. STEICHEN and the Rev. H. SIERP, of St Xaviers' College, Bombay. The results of these two observers were published in two papers in the Indian Medical Gazette, Vols, XLVI and XLVII (Dec. 1911 and Dec. 1912.)

The springs at Tuwa on the line from Bombay to Godhra (Panch Mahals) were found to possess unusally high radio-active properties. Comparatively large emanations were found at Vajrabai and Unci also. More work, however, requires to be done on the therapeutic properties of these and other radium-containing springs. ("Recs. Geol. Survey India of Vol. LII. 1921.)

These will serve by way of example to show how great are the resources of India in mineral

and thermal springs. Yet a comparison with the development of such springs in England and the continental countries only serves to show how greatly our own resources stand in need of development. In England the therapeutic qualities of mineral waters have been recognised for a long time. Famous spas have grown up on the sites, railway and transport facilities have been instituted for the large crowds who take the waters and every opportunity of propaganda has been taken to render them popular. The waters have been commercially exploited for many years and among those exported may be mentioned Malvern, Perrier and Vichy, which are obtained bottled in our own country. It is imperative that something should be done for the development of our resources in India instead of allowing them to languish as at present, and there is good reason for the appointment of such a committee recommended by the Poona All India Medical Conference. This would provide the first step. Vast possibilities are open for the treatment of certain diseases—of gout for instance, of which the incidence is large in India. With proper encouragement and direction the commercial development of Indian mineral and thermal waters would be attended with great success.

As a classification of natural water may be useful, the main subdivisions, based according to negative or acid ions, are given below.

CLASSIFICATION OF NATURAL WATERS.

This is based according to their negative or acid ions. The main subdivisions are as follows :

1. Chloride waters. Principal negative ion Cl.
   - A. Principal positive ion Sodium.
   - B. „ „ „ Calcium.
2. Sulphate Waters. Principal negative ion SO_4
   - A. Principal positive ion Sodium.
   - B. „ „ „ Calcium.
   - C. „ „ „ Magnesium.
   - D. Waters rich in iron or aluminium.
   - E. Waters containing heavy metals such as Zinc.
3. Sulphate Chloride Waters with SO_4 and Cl both abundant.
4. Carbonate Waters. Principal negative ion CO_3 or HCO_3
   - A. Principal positive ion Sodium.
   - B. „ „ „ Calcium.
   - C. Chalybeate Waters.
5. Sulphate Carbonate Waters. SO_4 and CO both abundant.
6. Chloro-Carbonate Waters. Cl and CO_3 both abundant.
7. Triple Waters, containing Chlorides, Sulphates and Carbonates in equally notable amounts.
8. Siliceous Waters ; Rich in SiO_2
9. Borate Waters. Principal negative radicle $B_4 O_7$
10. Nitrate Waters „ „ ion NO_3
11. Phosphate Waters. „ „ „ PO_4
12. Acid Waters. Contain free acid
    - A. Acid chiefly Sulphuric.
    - B. „ „ Hydrochloric.

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APPENDIX.

ASSAM.

CACHAR :—*Kopili* (25°30'30" : 92°41'). Three springs. Temp. 128°-130°F. Discharge moderate. Water said to be strongly saline by GODWIN AUSTEN but in reality pure and tasteless. Deposit a slight calcareous incrustation.

SIBSAGAR :—*Nambor* (26°24' : 93°56'). Three springs. Temp. 95°, 98° & 110°F. respectively. Discharge 8 gals. per minute. Water slightly sulphurous, but clear and palatable. Gas, slightly sulphuretted, is copiously given off.

BALUCHISTAN.

BOLAN PASS :—*Kirta* (29°36 : 67°31'). Copious flow of hot sulphurous water struck in a boring for petroleum at a depth of 360 ft.

KACHHI :—*Lakha* (28°1' : 67°30'). Hot spring. Water strongly sulphurous. Discharge copious.

LAS BELA :—*Kan Berar* (25°29' : 66°31'). Several springs, intensly saline and sulphurous. Veins of sulphur and salt are deposited in the surrounding rocks.

SIBI :—*Khattan* (29°34' : 68°31'). Several springs of sulphurous water. Temp. 109°F. Discharge very copious. Deposit considerable quantities of sulphur and calcareous tufa.—*Sprintangi* (29°55' : 68°8')—A small sulphurous spring, about a mile to East of the railway station.

Uch (28°45' : 68°40'). Springs in centre of valley, highly saline.

BENGAL.

BIRBHUM :—*Tantipara* (23°54'30" : 87°26'). A group of hot springs on the right bank of the Baklesar stream, a mile to the south of Tantipara. Five are surrounded by masonry tanks. Temp. 128°-162°F. Water impregnated with sulphuretted hydrogen. Discharge from hottest spring about 120 cub. ft. per minute.

CHITTAGONG :—*Babu or Bharat-Khund* (22°35' : 91°46'). Water cold, brackish, sulphurous, and chalybeate (contg. iron) copious discharge of gas, apparently inflammable.

There are eight other springs within a circuit of 6 miles ;

Balwa-Khund :—Water diuretic and slightly aperient.

Naulakha-Khund :—Warm and saline : Vapour inflammable.

Kauri-Khund :—Hot, saline, sulphurous, and chalybeate : vapour inflammable.

Dudhi-Khund :—Cold, saline.

Brahma-Khund :—Very hot and somewhat saline : slightly chalybeate : vapour inflammable.

Chandra-Khund :—Saline and exceedingly hot.

Suraj-Khund :—Hot, saline, vapour inflammable.

Sita-Khund :—Water pure and limpid.

DARJEELING :—*Mechi* (? 26°50' : 88°30'). Water clear, deposit oxides of iron : said to be efficacious for rheumatism and skin diseases. *Minchu* (? 27°6' : 88°18') five miles from Darjeeling. Water is carbonated, sulphurous, and chalybeate. Contains 6·74 grs. Fe_2O_3, 0 58 grs. S. and 2·04 grs. saline matter per gallon. It is said to be similar to that of Bath and one of the Horrogate springs, and to be efficacious in cases of gout, rheumatism etc.

JESSORE :—*Khajura* (23°16'30" : 89°18'30"). Two springs one of which is walled ; Temp. 82°F. Discharge of walled-in springs, 450 gals. per hour. Water contains carbonate of lime and magnesia, with a small proportion of iron. Solid matter, 28·29 grs. per gallon.

BIHAR AND ORISSA.

ATYMALLIK :—*Deoljhari*, about a mile to the N. of Wodsinga (20°44' : 84°34') several springs. Temp. of hottest 134° F. slightly saline. Strong discharge of H_2S.

CUTTACK :—*Atari* (20°12' : 85°33'30"). Temp. 138° F. Discharge copious with a quantity of H_2S.

HAZARIBAGH :—*Belkapi* (24°9'39" : 85°42'30") or *Suraj-Khund*. Four hot and one cold springs Temp. 169°,170°,190°, 173° Fahr. respectively. Discharge copious. Diposits chloride and sulphate of soda. The water is said to act as gentle aperient.

Doari (24°8' : 85°12'30"). Temp. 110° to 115° F. Water sulphurous and slightly saline.

Indra Jurha. (23°50' : 85°30'). Tepid, discharge small, sulphurous.

Katkamsandi (24°6'30" : 85°15'). Springs rise over a space of 50 yards in length. Temp. 110° F, Water brackish and gives off sulphuretted hydrogen. Contains silica, alkaline chlorides and sulphates, and iron.

Lurgutha (?) and Pindarkun (? 24°12' : 85°10'). Water of Pindarkun spring contains 22 grs. solid matter per gallon. Siliceous and saline. Temp. 116°F. Water from Lurgutha spring is similar, containing 25 grs. solid matter per gallon. Temp. 100° F.

Sosonia (?) N. of Hazaribagh. Water contains 11·3 grs. solid matter per gallon, carbonated and slightly chalybeate, with a little chloride of soda.

MANBHUM :—*Sheopur or Sarsa Khund*. (23°39' : 86°36'). Sulphurous. Temp. and discharge not recorded.

Tatlui or Tantolya (23°41' : 86°48'). Water sulphurous and slightly chalybeate. Temp. 190°F.

MONGHYR :—*Bhimband* (25°3'30" : 86°27'). Four groups of springs : discharge very copious. Temp. 145°-150° F. Water limpid and tasteless, leaving a thin siliceous deposit. Total solids 6·8 parts per 100,000.

Bhurka (?25°18' : 86°37') Temp. 112° F. Discharge copious.

Janam Khund or Bharari (25°7' : 86°24'). Two springs. Temp. 145°F. Slight siliceous and calcareous deposit.

Lachmi Khund (? 25°3' : 86°29'30"). Temp. 144·5° F. Not sulphurous. Leaves a slight siliceous deposit. Contains 7·52 parts solid matter per 100,000.

Panchbhur (25°6' : 86°21'). Not sulphurous. Temp. 85·4°F.

Rameshwar-Khund (?25°7' : 86°29'). Not sulphurous. Temp. 112°F. Leaves a very slight deposit. Contains 4·68 solid matter per 100,000.

Rishi Khund (25°14' : 86°32'). Water issues from a number of fissures at the edge of a pool about 140 ft. square. Discharge very copious. Temp. 104 to 114°F. Leaves no deposit.

Singhi Rikh Tatal Pani (25°8' : 86°18') Temp. 90·5°F. Discharge copious. Not sulphurous.

Sita Khund (25°22' : 86°36'). Discharge very copious. Temp. 140°F. Water clear and tasteless, but with a slight odour of sulphuretted hydrogen. According to HOOKER, the water was used in 1848 for the manufacture of soda water. About 1916 it was exploited as a table water by a Calcutta firm.

There are two branches of the main spring at Sita Khund—viz :—1. *Garampani*. Temp. 137°F. and 2. *Bainsapahar*, about a mile to the west, temp, 102°F. discharge is very sluggish.

PALAMAU :—*Jarum* (23°50' : 84°33'30"). In the bed of the Tataka River, several outlets. Temp. 132°F. Discharge not copious, but steady. Water emits H_2S.

Kokraha or Thatha (23°45'30" : 84°5'30") Discharge copious. Temp. 151°F. Water strongly impregnated with H_2S.

PATNA :—*Rajghir* (24°1′ : 85°29′). There are said to be 19 hot and 4 cold springs. Temp. varies from 100° to 110° F. Combined discharge copious. Water clear and tasteless. Much resorted to for bathing.

Tapoban (?25°0 : 85°33′). On southern side of the Rajgriha Hills five artificial pools from 10 to 12 ft. deep. Temp. 100° to 116°F. Discharge not copious.

SANTAL PARGANAS :—*Baramasia* (24°30′ : 87°30′). Spring issues close to a trap dyke in limestone. Discharge about 9 gals. per minute ; Temp. 93°F. Not sulphurous. Contains 36·4 parts solid matter per 100,000. Water used for drinking and bathing.

Bhumka (24°4′ : 87°25′). Situated in a small marsh. Temp. 82°F. Reported to have been formerly much hotter. Discharge scanty, not sulphurous.

Jhariya or Jherwa Pani (24°27′ : 87°31′). Spring situated at the eastern end of a marsh ; Temp. 93°F. Discharge copious. Not sulphurous.

Lau-lau-dah or Sibpur (24°22′ : 87°43′). Temp. 122°F. Discharge about 26 gals per minute. Profuse discharge of gas, slightly sulphuretted. Slightly saline. Water contains 32·72 parts solid matter per 100,000.

Numbil (24°5′ : 87°13′). Several springs rising in a small marsh. Temp. 119·5°F. Discharge copious. Strong ebullition of sulphuretted gas.

Susumpani (24°9′ : 87°21″). Temp. 84°F. said to have been much hotter formerly. Discharge scanty. Not sulphurous.

Tapatpani (24°12′ : 87°19′) Temp. 102°F. strongly sulphurous. Discharge about 2 gals per minute.

Tatloi or Tapnai (24°23′ : 87°16′). Water issues copiously over an area of about 20 by 2½ yards. Temp. 148°F. slightly sulphurous.

BOMBAY.

A list of analyses of waters from various mineral springs, wells, and rivers in the Bombay Presidency was compiled in 1859 by GIRAND and HAINES. The letters G and H below refer to the springs mentioned in this list. Total solids are given in parts per 10,000.

AHMEDABAD :—*Harsol* (23°22 : 73°5′). G & H. No. 19. Temp. about 80° or 90° F. Water has a peculiar taste, and is said to be very efficacious in certain diseases. Total solids, 13·84 ; NaCl=8·48 : $CaSO_4$=1·07 : Na_2CO_3=1·52 : $MgCO_3$=0·54 : $CaCO_3$=1·98 : SiO_2=0·28.

BROACH :—*Kawa* (22°4′ : 72°47′). G&H. No. 18. Cold. Total solids, 13·34 ; NaCl=6·74 : Na_2SO_4=2·04 : Na_2CO_3=1·94 $MgCO_3$=1·58 : $CaCO_3$=0·57 : SiO_2=0·47. The water is considered to be a specific preventive of hydrophobia.

CUTCH : *Mhurr* (23°33′ : 69°0′30″). A strong spring of warm saline water supplies a reservoir about 330 sq. yards in extent. The water is used at the alum works in the neighbourhood.

KAIRA :—*Lasundara* (22°55′ : 73°12′). G & H. No. 20. Three groups of springs. (1). Seven springs. Temp. 100° to 122° F. (2). One spring. Temp. 101° F. (3). Nine springs. Temp. 87° to 114° F. The hottest springs are strongly sulphurous and the water is saline. It is used in the diseases of the skin. Total solids, 60·76 ; NaCl=42·35 : $CaCl_2$= 14·53 : $CaSO_4$=3·88.

KATHIAWAR :—*Tulsi Shaw* (21°3′ : 71°5′) in the Gir hills. G&H No. 23. Temp. 124° F. Water used for bathing but has no medicinal properties. Total solids, 11·87 ; NaCl=7·92 : Na_2SO_4=1·13 : $CaSO_4$=0·41 : $CaCO_3$=1·33. SiO_2=1·08.

KOLABA :—*Pali* (18°32′30″ : 73°17′). G&H. No. 4. The spring is a mile from the village. Emits gas of unpleasant odour. Temp. 108° F. Total solids, 26·05 ; NaCl=11·01 : $CaCl_2$=13·28 : $CaSO_4$=1·43 : SiO_2=0·33. Supposed to be efficacious in skin diseases.

Sapa or Sari (18°5′ : 73°24′). G & H. No. 7. Three springs. Water sulphurous when fresh. Total solids, 11·4, consisting of chlorides of soda and lime, with sulphate of lime.

PANCH MAHALS :—*Tuwa or Tui* (22°48′ : 73°34′). G&H. No. 21. Numerous hot springs, some near boiling point, rising in a marsh. Water emits a rank sulphurous vapour. Total solids, 47·70 ; NaCl=39·69 : $CaCl_2$=7·19 : $CaSO_4$=3·82.

RATNAGIRI :—*Aranli* (17°19′ : 73°35′). G & H. No. 1. Three hot and two cold springs. Temp. 105° F. Water strongly impregnated with sulphur. Discharge about 1 gallon per minute. Total solids 4·9, consisting of chlorides of soda and lime, with sulphate of lime.

Mat (16°57′ : 73°33′30″). The matter is said to induce appetite. Temp. 157° F.

Rajpur. (16°39′ : 73°35′). G&H. No. 5. Springs intermittent, said to flow every two or three years. Discharge about 6 gallons per minute. Temp. about 90° F. Water alkaline, containing traces of common salt and sulphate of lime. Much resorted to for bathing.

Sangameshwar (17°11′ : 73°37′). G & H. No. 9. Springs about 3 miles from the town, rising in the bed of a rivulet. Temp. 105° F. Water slightly sulphurous. Total solids 1·3.

Tural or Rajwali (17°15′ : 74°57′). G&H. No. 10. Spring rises from basaltic trap, discharge about 11½ gallons per minute. Temp. 110° F. Water slightly sulphurous. Total solids, 9·6, consisting of traces of common salt and sulphate of lime.

Unari (17°37′ : 73°23′). G&H. No. 3. Several springs. Temp. ? 157° F. Water emits a strong sulphurous odour. Total solids 19·06. NaCl=12·83. $CaCl_2$=4·17 : $CaSO_4$= 1·59 : SiO_2=0·47.

SIND :—*Jain Pir* (25°0′30″ : 68°4′). G&H. No. 25. Hot spring. Temp. not recorded. Total solids, 18·34 NaCl=11·56, Na_2SO_4=2·02 : CO_3=2·11 : $CaCO_3$=2·17 : SiO_2=0·48.

Laki (26°15'30" : 67°57'). Three hot springs. Temp. 102 to 105°F. The water of one spring is highly saline. That of another is sulphurous and slightly saline, with calcareous matter. It has a great reputation as a remedy in skin diseases.

Manga or Mugger Pir (24°59' : 67°6'). G and H. Nos. 26-28. Three springs. Temp. 99°, 117° and 127°F. Discharge copious. Water tasteless, slightly chalybeate when fresh and sulphurous on issuing. It is held in great reputation for the cure of rheumatism, leprosy and skin diseases. Total solids, hottest spring 10·50 :—$CaCl$=6·64 : $MgCl_2$=0·65 : Na_2SO_4=1·37 : $CaSO_4$=1·76 : SiO_2=0·08.

Pîth or Ghazipur (26°27' : 67°30'). Water very hot, highly calcareous, and charged with H_2S. Discharge copious.

Sharan (26°25'30" : 67°55'). Springs of hot sulphurous water occur about 3 miles to the S. of the town.

Wagolur (24°48' : 67°16'). G and H. No. 30. Temp. not recorded. Total solids, 22·77 ; $NaCl$=10·44 : $MgCl_2$=5·04 : Na_2SO_4=5·58 :=$MgCO_3$=0·36 : $CaCO_3$=0·93 : SiO_2=0·18.

SURAT : *Amaral or Deraki Unei* (20°51' : 73°24'). G&H. No. 17. Several springs. Discharge more than 2 cub. ft. per minute. Temp. 115° to 120°F. Water emits sulphurous gas. Total solids, 12·79 ; $NaCl$=8·46. $CaSO_4$=1·64 : Na_2CO_3=1.86 : $CaCl_2$=0·15 : SiO_2=0·68.

THANA :—*Kokner* (19°42'30" : 72°54') G&H. No. 2. Several hot springs. Temp. not recorded, as hot as can be borne by the hand. Total solids, 80·55 ; $NaCl$=27·78 : $MgCl_2$=0·39. $CaCl_2$=50·03 : $CaSO_4$=1·89 : SiO_2=0·36.

Sativali (?19°45' : 72°51') G&H. No. 8. Four hot springs. Water saline.

Vivadhi (19°29'30" : 73°6') G&H. No 11. Several springs, rising in the bed of the Tansa river. Temp. 110° to 136°F. Discharge of the most copious spring about 12 gals. per minute. Water emits sulphuretted hydrogen and is said to induce appetite. Total solids, 22·64 : $NaCl$=12·41. $CaCl_2$=7·07 : $CaSO_4$=2·08 : SiO_2=0·88.

CENTRAL PROVINCE.

CHHINDWARA :—*Anhoni* (22°26' : 78°38'30"). Water issues from a trap dyke. Temp. 134°F. Discharge copious. Strongly sulphurous.

HOSHANGABAD :—*Anhoni Samoni* (22°38' : 78°25'). Water issues at the edge of a trap dyke for a distance of a quarter of a mile. Temp. 114°F. Abundant discharge of H_2S.

SURGUJA :—*Tatapani* (23°41 : 83°43'). Number of springs. Temp. varies from 130° to 190°F. Discharge copious. Water deposits siliceous sinter, and emits a strong odour of H_2S.

YEOTMAL :—*Khair* (19°54' : 78°58'). Several springs, discharge very copious. Temp. 87°F. Water clear but has an acid taste. Deposits large quantities of calcareous tufa.

HYDERABAD.

GULBARGA :—*Wajal* (16°28'30" : 76°36'30") and *Mudnoor* (16°36' : 76°33') near Shorapur. Warm springs having a very copious discharge have been mentioned in these localities. Temp. *Wajal*, 92° F. *Mudnoor*, 88° F. Water pure and insipid in taste.

WARANGAL :—*Baiora or Buga* (17°56' : 80°47'). Spring forms a pool 40 ft. by 30 ft. in extent and 5 ft. deep. Temp. 110°F. Water tasteless and pure, contains a little carbonate of lime in solution. Discharge small.

KASHMIR.

BALTISTAN :—*Askoli or Chougo* (35°41' : 75°48'). Several springs. Discharge very copious. Temp. 104·5°F. Emits large quantities of sulphuretted hydrogen, and deposits much carbonate of lime.

Bisilo Behitsil (35°52'30" : 75°27'). Water highly charged with sulphuretted hydrogen. Temp. about 160°F. Deposits large quantities of calcareous tufa and sulphur.

Chutran (35°42' : 75°28'30"). Discharge very copious. Temp. 110°F. Water without taste or smell. Deposits large quantities of calcareous tufa.

Duchin (*Dushkin*, 35°28' : 74°51'). Two springs, sulphurous and slightly chalybeate. Temp. 154°F. Deposits sulphur.

Khorkan (35°30' : 76°50'). Water sulphurous. Temp. 185°F. Deposits gypsum and sulphur.

Tosha (35°44' : 75°44'). Three springs. Water highly charged with ferrous carbonate.

CHANGCHENGMO :—*Gokra* (34°25' : 78°58'30"). Several springs. Water highly charged with carbonic acid gas. Temp. 120° to 150°F. Deposits of borax and common salt occur near the springs

KASHMIR :—*Islamabad* (33°44' : 75°13'). Two springs. Tepid, water sulphurous.

Pampur (34°1' : 74°59'). Water issues from contorted limestone rocks. Temp. 70°F. Emits sulphuretted hydrogen Said to resemble the water of the spa near Weymouth.

LADAKH :—*Knarung*, about a mile to N. E. of Skio (34°0' : 77°19'30"). Water tepid, without any decided flavour. Deposits an incrustation of soda, and is said to be used as an emetic.

NUBAR :—*Chusan or Panamaik* (34°47' : 77°36'). Two springs. Temp. 167°F. Faintly sulphurous, not perceptibly saline. Deposits calcareous tufa and soda.

RUPSHU :—*Puga* (33°14' : 78°25'). Springs numerous, extending for about 2 miles along the course of the river. Temp. varies from 80° to 174°F. The hottest springs contain sodium chloride and emit sulphuretted hydrogen. Those of lower temperature deposit borax. Sulphur and gypsum are deposited near the springs.

MADRAS.

BELLARY—*Ramandrug* (15°7'30" : 76°32'). Water slightly chalybeate and carbonated, with traces of Al_2O_3 and CaO.

GODAVARI :—*Gondala* (17°39' : 81°0'). Spring rises in bed of Godavari River. Temp. 140°F. Emits slight odour of H_2S.

Contains small quantities of sulphate of soda, common salt, and chloride of lime.

Kurnool :—*Kalva* (15°37′ : 78°16′). Three springs, situated a mile and a half to south of the village. Temp. 90°F. Discharge copious. Water colourless and tasteless. Deposit thick beds of calcareous tufa.

Lanjabanda (15°30′ : 78°3′30″). Several springs, situated about a mile to E. of the village. Temp. 85·3° F. said to be decreasing. Water slightly alkaline, deposits calcareous tufa and siliceous sinter.

Mahanadi (15°29′ : 78°41′). Several springs, Temp. 89°F. Discharge copious. Water clear and tasteless but slightly acid.

MYSORE.

Bangalore :—*Bangalore* (12°58′ : 77°38′). Water from a well in the cantonment contains 7·10 grs. carbonate of iron and 2 grs. sodium chloride, with a trace of carbonate of lime dissolved in carbonic acid. It is considered to possess same properties as Cheltenham water.

PUNJAB.

Gurgaon :—*Sohna* (28°15′ : 77°8′). Water strongly charged with H_2S. Not chalybeate. Temp. 108° F. It is said to resemble Moffat water, and is largely resorted to for the cure of skin diseases.

Kangra :—*Jawala Mukhi* (31°52′ : 76°23′). Water saline, used as a cure for goitre. The amount of salt and iodine in the water of six springs situated in the Jawala Mukhi valley are, in 1000 parts, as follows :—

	Salt	*Iodine*
Kupera Spring	22·0	0·0799
Jawala	26·30	0·09324
.. *2nd*	24·0	0·0799
.. *Mukhi*	22·80	0·0799
Nagia Spring	22·20	0·09324
Kangra Basa	23·0	0·09324

Lansa (32°23′ : 76°5′). Water sulphurous. Temp. 72° F. Water resembles that of Bareges, Hante Pyrenees, and contains, in 1,000 parts :—Na_2SO_4=0·159 : NaCl=0·740. Na_2CO_3=2·6000 : $CaCO_3$=0·040. It is used as a cure for goitre.

Tatwani (32°7′ : 76°46′). Spring rises in the bed of the Lun, a tributary of the Birmi R. Temp. 120° F. Water exceedingly nauseous, with a metallic flavour.

Tira or Jira (32°1′ : 76°14′). Saline spring. Temp. 108° F. Estimated discharge, 250 pints in 5 minutes. Water limpid, with a saline taste and slightly alkaline. Residue contains 92·33 per cent. of sodium chloride, with small quantities of chloride, sulphate, and carbonate of lime : also 0·012 parts of sodium bromide in 1,000. The water is compared with that of Bourboune les Bains, Haute Marne.

Kulu :—*Bashisht* (32°16′ : 77°15′). Three springs, one of which gives a copious discharge. Temp. 138° F. (120° F., Calvert). Sulphuretted hydrogen emitted. Much resorted to for medicinal purposes.

Khelat or Sita Khund, near Monali (32°15′ : 77°14′). Water sulphurous, and possesses a bitter taste. Temp. 104° F.

Manikarn (32°2′ : 77°25′). Fourteen springs. Temp. varying from 106·5° to 202°F. or the boiling point proper to the elevation, 5·587 feet. Discharge exceedingly copious. Sulphuretted hydrogen emitted, but the water is clear and palatable and contains 3·2 parts of saline matter in 10,000. It deposits large quantities of ferruginous travertine.

Spiti :—*Changhizang* (32·3′ ; 78°40′). Water issues from 7 or 8 small vents within a space of about 20 yards. Strongly charged with H_2S. Temp. 117·5° F. Deposits a saline incrustation. Gerard says that each spring is reckoned a specific against some complaint ; and that directions for drinking and bathing are engraven in the Tartar language on slabs of stone placed beside the appropriate vent. The water is said to excite a great appetite.

Mianwali :—*Bakh Racine* (32·40′ : 71·51′). Water strongly charged with sulphuretted hydrogen. Temp. 94° F. Deposits sulphur on evaporation.

Patiala :—*Pinjaur* (30·48′ : 76·59′). Two springs. Chalybeate and sulphurous. Temp. not recorded, but said to be decreasing.

Simla Hills States (Basharh) :—*Jaori* (31·32′ : 77·50′). Five springs. Temp. 130·5 F. Water clear, with a strong sulphurous smell with a very disagreeable saline taste. Deposits ferruginous matter.

Bhajji :—*Suni* (31·14′30″ : 77·11′). Eight or ten springs, on right bank of Sutlej R. opposite the village. Temp. 135° F. Water strongly sulphurous, with a very disagreeable saline taste. Contains chloride and sulphate of soda.

Bilaspur :—*Bhasra* 31·24′ : 76°47′). Near the source of the Chand Khud. Temp. not recorded. Water strongly saline and has a slightly aperient quality. Said to be efficacious in cases of scrofula, dropsy and rheumatism.

RAJPUTANA.

Mewar (Udaipur) :—*Gangar* (45°3′ : 74·40′). Spring rises through sandstone. Temp. 80° F. Water slightly saline and sulphurous.

SIKKIM.

Beopertam (27°34′ : 88°23′). On the right bank of the Rinpiram R. a short distance below its junction with the Ronghep. Two springs. Temp. not recorded. Water strongly impregnated with sulphuretted hydrogen.

Momai (27°55′ : 88°45′). Springs about a mile below the foot of the Kinchinjhau glacier. Temp. 110° to 116° F. Water strongly sulphurous. Contains 25 grs. per gallon of sodium chloride, sulphate and carbonate. Strongly alkaline when concentrated.

Phuj Sachu (27°14′ : 88°21′). Water has a disagreeable smell and deposits a whitish substance. It is used medicinally. A similar spring issues at Pukeaz Sachu, also on the great Rangit River.

Yeamtong (27°49′ : 88°45′). Several springs. Temp. 112°6′ F. Discharge a few gallons per minute. Water has a slightly saline taste, and emits sulphuretted hydrogen. Contains chloride and sulphate of soda. Used for bathing.

TIBET.

HUNDES :—*Tirtapuri* (31°8′ : 80°52′). Two springs. Water clear and very hot. Deposits calcareous tufa.

TSANG AND U :—*Kampa Dzong* (28°17′ : 88°34′). Springs situated about 5 miles to N. N. E. of village. Temp. 140° to 175° F. Water strongly sulphurous. Extensive deposits of calcareous and siliceous tufa surround the springs.

Khangma (28°33′ : 89°44′). Springs formerly more active. Large masses of travertine have been deposited. Temp. not recorded.

Yoja (27°58′ : 89°2′). Thirteen springs. Temp. probably about 110° F. Water distinctly sulphurous. Greatly frequented for medicinal purposes, chiefly the cure of skin diseases and rheumatism. Each bath is supposed to be specially adapted for the treatment of a specific disease.

UNITED PROVINCE.

BANDA :—*Banda* (25°29′ : 80°23′). Water from well used in lac dyeing. Temp. normal. Strongly charged with H_2S. Contains small quantities of NaCl and $MgCl_2$ with $CaCO_3$ and K_2CO_3.

BENARES :—*Benares* (25°18′ : 83°4′). Water from the Bridhkal Khund, a well in the city. Contains 7·4 grs. of solid matter in 1000, consisting of NaCl, $NaNO_3$, KCl, KNO_3, with a little Na_2SO_4 and $CaCO_3$. It is said to possess slightly aperient quantities when taken in large doses.

DEHRA DUN :—*Landour* (30°27′ : 78°10′). Several chalybeate and sulphurous springs occur in the neighbourhood. Details of a number of cases in which the use of the waters has proved beneficial include debility, diseases of the liver and spleen, rheumatic and cutaneous complaints etc.

Sahasradhara (30°25′ : 78°11′). Water strongly impregnated with H_2S. Temp. 72°F. Deposits a thick coating of sulphur on the sides and bottom of the spring.

GARHWAL :—*Gaurikhund* (30°39′ : 79°5′). Two springs, hot and cold. Temp. of hot spring about 130°F. Discharge copious. Water has no taste or smell but contains carbonate of lime and iron. Water of cold spring slightly saline and strongly chalybeate. Temp 72°F.

Palia or Wazirgarh (30°54′ : 78°23′). Several springs. Water tepid, clear, impregnated with sulphuretted hydrogen and iron.

Tapoban (30°29′ : 79°41′). Discharge fairly copious. Temp. not recorded, but very hot. Water chalybeate. Deposits a yellow incrustation.

Tehri Garhwal Jamnotri (31°0′ : 78°31′). Numerous springs. Temp. 192°6°F. Discharge very copious. Water transparent and tasteless (bitter and ferruginous, according to some) Deposits a thin calcareous and ferruginous sediment.

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Observations on Wet-Nurse in India

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Wet-nurse is called in Telugu "Palathally" literally "milk-mother," but it has a meaning of its own, when read in broad lines, as one capable of giving milk to a baby not her own, when its mother fails to put it to her breast for reasons various, social, physical, mental and pathological. Some of you may be curious to know those various abnormalities surging on the modern mothers that impede them from nursing their infants. They are not new to you as one in profession. You know that I have classed them as above from the various chances given to me in my practice. If I begin all those social and acquired contra-indications for maternal nursing before I exhaust all the other known possible peculiarities physical, mental, and pathological, you may laugh at me and say that I am biased and one-sided. Naturally mothers may be excused if they are sufferers from Bright's disease, pleurisy, advanced valvular disease of heart, acute hepatitis, pernicious anaemia, leukemia, malignant carcinoma, and sarcoma of breast, goiter, syphilis, elephantiasis, leprosy, exanthemata of malignant type, erysipelas of breast, acute pneumonia etc. To make matters worse there are some local conditions of the breast and nipple which are instrumental in not allowing maternal nursing, such as depression, excoriation, eczema (weeping), cracking of the nipple, and abscess of the breast. Some of you might be anxious to know something about mental derangements which

have been in some cases the stumbling blocks in the way of maternal nursing such as paralysis, severe neurosis, insanity, hysteria, epilepsy, neurasthenia of a marked type (*Sutika*) and alcoholism. Now finally coming to those social and acquired contraindications to maternal nursing, I shall try to bring to your notice things which up are not unfamiliar to you. We are all aware of them but for advanced Western civilization they would find no place in any of our households.

For example :

1. Women with contraceptives in lapses fearing exposure, fail to nurse their illegitimates.
2. Women, under pressure of modern civilization by keeping up late hours at nights—due to constant attendance at cinemas, theatres, dinner and picnic parties fail to nurse their legitimate infants.
3. Women, fearing lest beauty missed fail to nurse their infants, under pseudo-covering of advice from doctors, as infant shy.
4. Cinema and stage girls leave their illegitimates without nursing in asylums and foundling homes.
5. Women with jolly taxi-rides never nurse their infants but employ wet-nurses or leave them at homes where they are cared for.
6. Tennis and golf playing women in general never nurse their infants fearing extra exhaustion.
7. Prostitutes as a rule, never care to nurse their infants, if by chance they are blessed with any failing trials in abortion and birth-control.
8. Posthumous infants, as a class are left to wet-nurses or on cow's milk, or on artificial foods due to severe mental shock that their mothers are subjected to.
9. Women claiming sex equality in education and franchise as a class, abhor nursing their infants to march with civilization.
10. Women, claiming offices along with men, find no time to nurse their infants.

Especially in cities and towns, if any of you were to notice now-a-days any mother in our Indian houses failing to do her legitimate duty of nursing her infant, you will find no difficulty in classing her as per above.

I tender my apologies for bringing in so many ways of social contraindications to maternal nursing before you. I do this just to enlighten you why Miss Mayo has not included them in her "Mother India", all those aspects of Western life which have been pressed on us as notable marks of civilization and which our Indian mothers, thinking equality and freedom as one's birthright, with weak hearts, have been trying to adopt them forgetting the fathomless pits that they would be led to in the long run, disrupting religion, maternal love, moral calibre, chastity and domesticity which have been the hall marks of Indian womanhood from time immemorial. But you will entirely miss from the Indian labouring class such vagaries of advanced social life increasing in alarming strides leading to maternal and infantile mortality as noticed all over the civilised world. Many research scholars in pediatrics have from time to time given their warning note to remove this abnormal awakening among the women. But times are such. None can stop those surging phases of modern life among women as they seem to race with civilization. The pity of it is that they are pressing forward towards East all those quixotic emblems of Western social life without sanction either of religion or decorum. FINDLAY of Glasgow, LANGMEAD of England, HOLT of U. S. A., and BLUHUM of Germany have admitted this without reserve that women in Europe and America are becoming less and less liable to feed their babies adequately at the breast and that artificial feeding is increasing to race with the mad modern civilization leading to upward infantile mortality curves. Just see how unreservedly they condemned even their own ways of social life among the present generation. But our Indian infants may die in great numbers out of sheer neglect in the upper class to nurse them, of disease due

to want of awakening in hygienic principles and of starvation wages in the lower classes. Anyhow I am pleased with our labouring classes with all their drawbacks, as they never fail to nurse their infants.

2. If this were to be all over India mothers failing in their legitimate duty, the infantile death curve would be terrific. I believe only ·002 p. c. of women in the upper class would not care to nurse. The rest of the Indian women would do their holy duty to their infants with pleasure and love. For I am seeing daily kind mothers among the labouring classes take their infants to their breasts and rear them with foundling love taking the best of precautions in their diet, lest their infants fall sick due to their faults. I see these women carry their infants during their labour rounds and nurse them as often as the infants need breasts. Nay, the infant is tied to her shoulder cloth and slung below the arm-pit leaning on her waist with the breast in the infant's mouth, even in her labour rounds to the market, to the farm, and to the kitchen. It is no exaggeration to say so. If you go round the towns, travel through the villages, go up the ghauts, and sightsee the coastal villages, you will not fail to see the cooly women in the towns, the pastoral women in the villages, the seminude women (Khonds, Koyas, Savaras, Gadabas and Malbaries) of the ghauts and the fisher-women of the coastal villages, carry their infants in their arms nursing. Why, you see all over India the Lambadics of the Dominions, the wandering Gypsies of the plains, the Chinese paper-toy sellers from the East, the wandering Irani and Roumshaw, razor, scissors, and padlock mongers of Bundelkhand, and the Santhalies of Behar, are no exception. The rich families if they wish their infants grow to Spartan manhood, have not thrown aside this social duty of putting their infants to their breasts. It is only now in the 20th century, the civilization has been running mad from worse to worst. There is a growing tendency among the civilized women not to keep their infants to their breasts with or without reason. This has been creeping from West to East, which has been fairly religious, sticking to its social dogmas up to now, but this wild enthusiasm, without any meaning, without any religious sanction, and without any feminine decorum, has been spreading like wild fire, devastating totally motherly love, feminine modesty, infantile grit to parents, healthy infantile growth and finally leading to increased infantile mortality, ignobly forgetting to wake up from this wrong done to the infant.

3. Don't you think when you find mothers fail to nurse their infants your next best is the wet-nurse? So if you wish to have a wet-nurse now-a-days, generally when asked for engagement, the reply will be in the negative, saying that they care more for the growth of their infants than for the others even for money. Even a cooly woman never cares for such engagement. I have not come across in the dailies columns calling for wet-nurses, as have been done in Europe and America. In Austria there are supposed to be always three thousand good-milk-giving-wet-nurses from the agencies that have stocked such women. There are no such agencies in India so far as my knowledge goes. Even in palaces of the Rajas and Zemindars, there is a growing tendency to engage such women on monthly pay of Rs. 5/- to Rs. 10/- for their infants. They give them food, clothing, and home, along with the infant's mother. Poor women, who are incapable of nursing their infants for any reason, try to beg neighbourly women of caste or no caste and see their infants reared thus. It is no ostracism if a Pariah woman rears a caste Sudra woman's infant, as there is a belief that infants shall not lose caste so long as they do not cut teeth and take to rice.

4. Though impracticable in India and to many of us, DR. KOPLIK (in his diseases of infancy and childhood) has very nicely and tersely drawn the attention of every one of us if we were to recommend a wet-nurse on any account. The method of examining a wet-nurse as per his description as to fitness begins with ascertaining the history of her own baby. It should sleep well in the intervals of nursing, be free from colic, be of the same age or not

over 3 months and have normal movements. The baby should be completely undressed for examination. It should be at least tolerably well nourished. There should be no eruption on the skin, no copper-coloured intertrigo, no snuffles, no pigmented spots, and no rhagades arounds the mouth or anus. The skin of the palms of the hands, or the soles of the feet should not be fissured or hard or present suspicious pigmentation. The head should not have an idiotic, microcephalic conformity. The wet-nurse should be below the age of thirty. Old multiparae do not, as a rule, furnish good milk. The milk should have a bluish-white tinge. Some specimens separate almost instantly upon withdrawal into a yellowish, oily layer on top and a serous liquid below. With such abnormalities, one should reject the wet-nurse. The milk should possess plenty of milk-globules and no colostrum corpuscles. Specific gravity of milk must be 1020 to 1030 with 3% of cream by lactometer. The shape of the breast is important. The pear-shaped, elongated, hanging breasts furnish more milk than firm round breast of virgin shape. The nipple should be about one centimeter long and ¾ of a centimetre in diameter. The baby can easily grasp such a nipple and draw it into the mouth. A flat nipple, or a nipple with fissures, or a nipple surrounded by eczema is not desirable in a nurse and may even be dangerous to an infant. The nurse is examined for traces of any eruption which may be luetic. Pigmented macules should arouse suspicion, as also enlarged cervical or epitrochlear lymph nodes. The lungs especially the apices are examined for bronchitis or tuberculosis. The nurse is rejected if there be the slightest evidence of spinal involvement. The teeth should not be carious to such an extent as to preclude the possibility of their being kept clean. The presence of a fœtid ozena is highly objectionable apart from the offensive odour. Such cases may be latent tuberculosis. The nurse should be mentally sound. The wet-nurse is then examined as to presence of venereal disease by inspection of introitus vaginae and the anus. The mucous membrane of the mouth should be examined for evidences of syphilis. Search is made for mucous patches and suspicious cicatrices. After having examined both child and mother in the manner datailed and subjected both to a Wassermann test, they are in a position to be recommended if the milk is satisfactory and if the Wassermann is negative.

5. From the above, one in India, should be very cautious to select a wet-nurse. It is not an easy job here as in the Western countries to go in detail in such a selection where the agencies that devote to supply wet-nurse in a moment's notice, have always kept them in reserve, say thousands in Vienna, Prague, Iglau and Subarbe, peasant class from the north of France, a special reserve of wet-nurse at Paris and an equal number in New York and Philadelphia with medical certificate of negative Wassermann as to their fitness for such purpose. I think there is not much scope for, keeping such agencies in India, as there is the least demand and chance to profit doubly thereby. FISHER puts it that 20 to 50 florins per month have to be paid for a wet-nurse, in Vienna, Prague, and Ighau, 40 to 50 dollars in New York but you will get a wet-nurse in India for Rs. 5/- to Rs. 10/- with or without food and home. A great many families in India after European and American fashion do not care to take wet-nurses as they are women of the lowest walks of life with the least personal hygiene, and prefer to take always a known woman, who has been married; but it is found next to impossibility to procure in India even a moderately ideal wet-nurse of DR. KOPLIK'S description. If one were to take the trouble to examine her as shown above, no Indian woman even from the lowest dregs of society would care to accept the engagement even at higher wages. She might allow a thorough superficial examination of breasts and with clean washed breasts for each feed, but no examination of chest, blood, and vagina. Thus our Indian infants in rich families are cleverly handicapped or rather trapped to such diseases of the wet-nurse particularly tuberculosis and syphilis. I often take objection to nurse an infant if she is suffering from elephantiasis (extremities or breasts). So elephantoid wet-nurses must also be rejected along with many others, such

as leprotic woman, a woman with cancer breast, and a woman with goiter. One should be careful to note cleverly the tricks of the wet-nurse, who has been defined as "one part cow and nine parts devil" (EDGAR). I have seen my people catching wet-nurses with (1) bomboo cylinder filled with water hidden in their armpits, (2) wet clothes hidden in their waists, (3) small bottles with boiled rice water (*Ganjee*), (4) small cans filled clean with rice water (*Kadugoo*) and many more have been observed only when they are asked to draw milk before suckling. If pressed on further, they attend at unusual hours to evade being caught. Some women pose themselves as wet-nurses showing a baby not their own even after losing theirs by death or abortion. Such women with less milk bring with them thin *rava ganjee* strained well and put in small tins and goat's milk well diluted and put in small bottles as substitutes. An Indian wet-nurse of good breed and society, as I told you above, is very hard to get for an infant. If any one is procurable, she will have no objection to say that she will put the infant to her breasts but not draw milk for its use. I have seen some will do both drawing milk and putting them to breasts. If the infant cried after the feed from the breasts, it is a sure sign that it has not taken or given sufficient milk. If the infant leaves off the nipple and tries to play with it, it means that the infant is either breast-shy or the breasts have no milk or the nurse has been otherwise engaged before she actually nurses the infant, thus showing empty breasts, or the nipples might be pretty hot for the infant if she was suffering from high fever or the breasts or even milk might smell foul and disgusting to the infant due to excessive use of garlics, onions, asfetida, fishes, etc.

6. I have often heard in my rounds from mothers that their wet-nurses are not up to the mark. Some have not the required milk, some come after finishing their other engagements some fail to give a good feed to infants, some do not take babies to their breasts. Some pump out milk only and some will do both. There are certain classes of women that are excellent wet nurses. I do not know much of the other parts of India. I can confidently say from my experience that the fisher women (*Jalari Sreelu*) of the coastal regions and the shepherd women (*Golla Sreelu*) of the villages have been proved to be excellent wet-nurses. They can easily manage to nurse another infant in addition to her own. At least there are none in these parts to compete with this class of women. The yield is more than required. The charge is very low. A quarter seer will cost only two annas. A nurse of the fisherman class can give nearly a seer at two sittings, morning and evening, of good milk from both breasts satisfying all the tests. Some can give more than this, say two seers at six sittings. I believe it is probably due to their diet, which is the main spring of such good milk progress. They eat a lot of fish, sweet eatable tree roots (*Karra Pendalam*), sweet potatoes (*Gerra Dumpalu*), raw papayee fruits, curry (*Boppayee* curry), boiled rice water (*Ganjee*) and cold semi-fermented rice water (*Taravani*) and a good ragi fee (*Bhoodi Ambali*) before starting to work early. They do not take any intoxicating drinks or toddy though the latter has been talked of to increase plenty of milk like the beer in western countries. Even in the dead part of the night one can easily procure any quantity of breast milk either for infants or for the sick and convalescents. This sort of happy acquisition could be had only to those people of the coastal towns and villages on the plains. This is no exaggeration, as it has been proved to be such in all our families to engage such wet-nurses whenever mothers fail to nurse their infants on any account. The milk of such wet-nurses is moderately thin, easily digestible, and gives the baby a bonny appear ance of good progress in weight and health. Only if the woman eats a good lot of fish, rotten meat, green vegetables and oily cakes, there you will find a slight upsetting in the babies thus fed. Though they are known as dirty people with the least hygienic principles and with dirty clothes to wear, they can be adjusted by making them clean their breasts before use and secondly making them wear a clean cloth lent to them. After doing her business she will have her own cloth, leaving the

lent one, for future use. If she is informed at once of any irregularities in the baby progress, she will have no objection to restrict her diet as per instructions from the mother but she will generally ask either for more *bukhsies* money or for taking her into the house and fed likewise to avoid further troubles in the baby. With a motherless baby there is a great difficulty in rearing it up. I have experienced with a relation of mine any amount of unexpected troubles from these wet nurses at Vizagapatam, when his mother left him alone in his fifth month. He is now a bonny sturdy fellow but with the lowest type of acquired psychic development of mind, body, brain, and character. I cite this just to warn the dangers that are attendant on indiscriminate selection of wet-nurses. Some religiously minded people rear their orphans and nurse infants solely on cow's milk with a confidence as old as earth and deep as sky that babies fed on cow's milk grow bonny and healthy with fully developed brain and character.

7. You may be surprised to hear that infants will not indiscriminately suck all sorts of breasts from dirty pseudo-wet-nurses. If they are accustomed to one clean wet-nurse, they do not go to others. I believe they have got an infantile intuition in this respect. If an infant cries and cries for nothing half an hour after a good feed, you are to know for certain that the milk of the woman has upset the baby. It is imperative to examine the milk of the wet-nurse and see if it is thick with colostrum corpuscles. If this is so reject at once such wet-nurse and select another whose milk has a normal consistency. Milk of a young (primipara) cannot be taken as good. It is thick and insufficient. Always go in for a multipara with a baby not over 3 months whose milk is of normal consistency and sp. gr. 1030. Such milk is always good, healthy, and easily digestible. If the infant vomits curdled flakes within an hour after a feed, or passes a curdled stool with white flakes such milk of the wet nurse is not to be continued to the infant any longer. Any how the health of the infant always keeps up with the health, diet, environment, and other social changes connected with the wet-nurse. If the wet-nurse is laid up with influenza or malaria or any exanthemata, such wet-nurse ought be given up. If the wet nurse eats a lot of green picked up from the fields, roadside, and tank bunds, due to poverty and starvation wages and if the infant fed on such milk passes green stools with colicky pain recognised by constant crying, it is best to stop such wet-nurse or better to take her into the house of the infant and fed her properly. During menstruation, the milk usually shows a marked decrease in fat, loss in sugar, and increase in proteids. In some cases, equilibrium is regained quickly, in others more slowly, but with careful observation, menstruation is no contra-indication to breast feeding. A wet-nurse with pregnancy usually increases her fat content and diminishes the proteid and thus the child loses weight. Mothers should often inquire into the periods of the wet nurses and whether they are carrying or not, as these points if neglected would tell upon the infants' health. A wet nurse, who has weaned or is weaning is not fit to take up nursing of an infant far below the age of her infant or child. There are so many "don'ts" prescribed, even after medical selection of a wet-nurse by doctors of Europe and America, but I am proud to note that such "don'ts" are quite unworthy of being repeated here, as it is rare to see an Indian wet nurse drunk, drugged (opium), intoxicated or over menued. I am rather pleased to read such "don'ts" prescribed to western women by western doctors. Miss MAYO ought to be conversant with such literature before she went on trying to remove coal dust from Indian womanhood. With an apology, I recommend her (1) Daughters of Ismael (R. F. KAUFFMAN) and (2) Judge LINDSAY'S Revolt of Modern youth to retract some of her statements from her "Mother India" biting her delicate fingers bitterly with a deep sigh for her pressured and misguided attempt on fair India. Every Indian ought to read them.

8. Not only the rich women of these parts (Circars) but of other parts of India do greatly rely on wet-nurses, but they go to step higher in the towns. They give away their infants as

motherless to wet-nurses who nurse them at their houses till the infant grows up to the second or third year, just able to take and digest rice along with the other members of its natural mother. Every now and then the infant is taken to its mother to make a show of its growth and health. Is it possible for such children to keep up maternal love and dealing and *vice versa*? Love is here almost lost and never can it be put on like that of the infant fed on its mother's breast. As civilization progresses, love is ever lost with all its meaning. I have strong reasons to bring the above to the notice of my hearers (readers and parents), as I always find all over such a custom of leaving infants with wet-nurses for two or three years leading to baneful influences both on society and on the healthy home of its natural parents. Indian women of rich families ought to be ashamed to hear that queens and princesses of royal households of Europe and elsewhere never shirk this responsibility of giving milk to their infants. Though certain honourable ladies-in-waiting volunteer for this honourable piece of duty to infants, the royal mother as well takes as much care as the wet-nurse by putting her infant to breasts as often as desired. There might be exceptions like that of the Empress of Austria, who under advice from her doctor, took one certified nurse from the institution of wet-nurses at Iglau in Maharan (Austria-Hungary) for her royal infant. The Princess of Bulgaria did the same from this institution, when she was asked not to nurse her royal infant. I had many an occasion, with curiosity enough, to ask European mothers in India if they wish to put their babies to breasts like the Hindus. I often received a reply with reprimand, that humanity needs such rearing up of one's infant without being asked to do it, if the mother really has had a love for the infant without being pressed for it as a show.

9. Lastly I should like to make a hearty request to all parents (rich and middle) not to go in for wet-nurses unless mothers are dead, or disabled by disease or other physical derangements. I always wish that mothers show respect, love, and filial duty to their infants-in-arms by putting them to their breasts, taking a lesson from the labouring. Further, I would like to put a strict ostracism on those mothers that go in for invalid's and infant's foods (*i.e.*, Horlicks, Glaxo Mellins, Cow and Gate, Lactogen Ovaltine, Bemax, Allenbury's Triple foods) and make them understand that these foods are never intended, being deficient in their vitamins and disproportionate in composition, to replace as real substitutes to natural human milk, which has all the required vitamins, but are intended only to meet the exigencies of milk starvation human or otherwise (cow) and to resuscitate the convalescents with easily assimilable liquid diet. If they are taken in earnest, contrary to the instructions of her husband and doctor, by such mothers as natural foods for their infants, there will be not time enough for them to repent for such hasty nursing as such infants grow weak, never put on flesh, get flabby to extremes, prior to serious impending sickness, always suffer from gastric troubles, with skin, ear, and lung troubles, with a sudden apthae of the mouth leading to gangrene and with many more unimaginable complaints leading to rachitic and scurvy ridden children.

10. Failing to be fed on the mother's milk we know that wet-nurse is the next best with all the necessary precautions in selection, diet and home. If both these are quite impossible to procure with ease, I always prefer cow's (or goat's) milk, which is the best of all. Our Ayurvedic system and our religio-social customs enjoin it with results most exhilarating and promising. The brain development takes its progress with the kind af nursing. If it is fed on its natural mother, it will take all the good psychic qualities of its mother: but if it is otherwise, there will always be a deteriorated development of its brain in conformity with the psychic growth of the wet-nurse's brain, contrary to its natural mother. So to avoid acquiring such bad diathesis through unknown wet-nurses, I would prefer always cow's milk (or goat's milk) adjudging to the needs of the infants. Never go in for invalid foods. The rich and middle classes are very fond of them being lay and indifferent to put

their infants to their breasts, but, I infer, lest beauty missed. So with this warning I will pray to God that all infants (Indian) are to be fed (1) either on their natural mother's breasts, (2) or on the wet-nurse's breasts after a good and through selection (3) or on cow's (or goat's milk) but (4) never on imported invalid foods. One may object to cow'milk fearing bovine tubercle bacillus. Vast pastures and plateaus of Indian plains are open for the direct sun's rays all round the year. The herds of cattle that roam about and graze thereon under the direct sun are ever free from tuberculous taint. In those parts (Europe and America) where the sun is rare and raw milk is taken, there is fear of bovine tubercle entering the system. Here in India from Cape Comorin to the Himalayas there is no need to take raw milk, but hot milk. The cattle are in a way sterilized by the sun's rays and next their milk is sterilized by heating. Thus there is no need for alaram in India in taking cow's milk Likewise goat's milk has been prescribed for centuries as a specific diet against tuberculosis. You know that since the last ten years our knowledge in dietary requirements of the human organism has revolutionised and subsequently blown up the old belief. It has been proved and generally accepted that what has been shown as chief ingredients in the food value of our daily ration are quite insufficient to satisfy the needs of the animal for growth and maintenance of health and there exist indispensible accessory factors of diet called vitamines (FUNK), which have been classed as (1) Vitamine A (fat soluble) (2) Vitamine B (water-soluble anti-beri-beri factor) and (2) Vitamine C (water-soluble anti-scorbutic factor). It has been proved that all these three are in milk (cow or human). Since the rate of growth of the calf is greater than that of the infant, it is not improbable that the cow's milk is a source of accessory food factors (vitamines A, B and C) adequate for the infant. Since the cow probably represents a species little susceptible to scurvy, vitamine C is less certain in milk and so when it is given to infants its deficiency must be replaced by orange-juice now and then to raise its standard of efficiency along with human milk. (DR. DRUMMOND: *Lancet* 1918). Our women, with exploring truths and half-truths from experienced women regarding the efficacies of invalid foods, would repent early, if they were to take up in haste to nurse their infants with such foods which have been proved often and often lacking greatly in their vitamins (A, B and C) and found to be quite useless to replace either human or cow's milk. In short the rich and the middle class should take a lesson from the poor and ought to be ashamed of their criminal negligence of putting their infants to breasts, which are the baby's heritage to claim.

When you go on in your professional rounds always keep an eye how your little patient is being reared for well or ill. Condemn all invalid and infant feeding by opening to them all those dangers that would follow such feeding. Let your mission be breast feeding-natural or through the agency of a wet-nurse. Let you not forget to preach them the advantages of such feeding by bringing home such examples as to confirm your stories from your varied experience. If you meet women failing on any account to nurse their infants, you can as well enlighten them at least on cow's milk, which has all the vitamines of human milk and which has been our main source for centuries to rely on it for ever and ever. With these few observations of mine on "Wet-nurse-in-India" and with apologies to you for any omissions and commissions, I close this my venture before you. *

* Paper read before the Scientific Section of the VII All-India Medical Conference held at Poona in 1931.

Economic Aspects of Some Indian Indigenous Drugs

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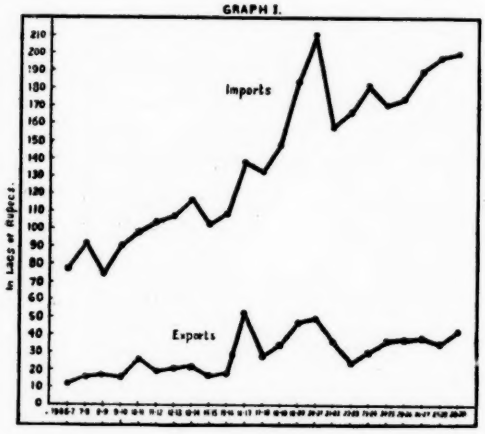
The drug resources of India are vast and inexhaustible and it may be said without much exaggeration, that, with suitable opportunities, India can supply the whole world with medicinal herbs and drugs. Leaving aside for the time being, the large number of drugs used in the indigenous systems of medicine in India, nearly three-fourths of the drugs mentioned in the British or the United States Pharmacopoeia, grow wild and in great abundance in the different parts of India. India, as you all know has been called the epitome of the world and indeed she possesses such wonderful variability of temperature, soil and climatic conditions that every conceivable drug ranging from those growing in the hottest tropical climate to those growing in temperate and very cold climates may be made to grow in her soil. Nature has bestowed with a bounteous hand all the medicinal drugs and herbs which her people require. Inspite of this it is surprising to learn that India imports nearly Rs. 2 crores worth of drugs from foreign countries. Though there is also an export trade, this is insignificant in proportion to the large import trade. You will see the relative positions of the trade from the graph given below.

GRAPH I.



What actually happens is that a good deal of raw material is going out of the country and instead we are receiving very considerable quantities of refined preparations manufactured in foreign countries. This indeed is a very disappointing state of affairs. I will put before you, in this connection, a page from the Seaborne Trade Statistics of British India showing the items of drugs and chemicals excluding narcotics, imported to and exported from the country.

From a perusal of the table overleaf you will find that, of the 2 crores worth of imports, the proprietary and patent medicines have taken a toll of nearly 42·8 lacs. These medicines have shown a phenomenal increase during the last 5 years *i. e.*, from about 25·0 to 42·8 lacs. Their sale is increasing by leaps and bounds. This state of affairs, it must be admitted on all hands, has been created by incessant canvassing and advertisements rather than by the efficacy of the patent medicines placed on the market. By every mail, one is flooded with literature explaining the virtues of these drugs in glowing terms and we, as credulous little children, allow ourselves to be duped and exploited. Leaving aside for the moment the question of patent and proprietary medicines, India imports a number of other drugs and preparations from foreign countries regularly. Even to this day, crude drugs like podophyllum, squills, ergot, etc., are being brought in from America, Russia and Spain. Finished drugs like tinctures, solid extracts etc., are also coming in. India is hopelessly dependent for almost all her pure and heavy chemicals used in medicine and pharmacy and in analytical and scientific work on Germany, Great Britain and Japan. The whole range of anesthetics, both for local and for general use, the whole gamut of synthetic preparations, the constantly growing series of preparations for radiological purposes, all the essential oils—to mention only a few—must come from abroad to help her countless millions. Practically all the fine chemicals and basic alkaloids like caffeine, strychnine, atropine, santonine, etc., are derived

TABLE I.

Drugs and Medicines (excluding Chemicals and Narcotics) imported in India during five years from 1924-25 to 1928-29.

Name of Drugs Imported	Quantity					Value in Rupees				
	1924-25	1925-26	1926-27	1927-28	1928-29	1924-25	1925-26	1926-27	1927-28	1928-29
Aloes—cwts. ...	1,961	547	2,375	1,004	...	37,218	12,394	67,792	25,543	Included in Drugs of others sorts.
Asafœtida—cwts. ...	6,335	2,719	3,947	3,236	3,612	3,77,005	1,86,642	1,57,412	1,14,532	2,08,343
Camphor—lbs. ...	2,07,150	9,93,007	14,10,695	13,73,701	16,12,356	23,02,563	21,47,341	27,96,850	25,93,177	27,79,631
Cocaine—ozs. ...	747	1,334	551	1,157	1,259	11,082	20,737	11,636	17,622	18,476
Cod Liver Oil—lbs....	...	84,827	66,857	75,638	90,602	...	1,50,097	1,22,733	99,435	1,30,796
Morphia & Preparations of Opium—ozs.	640	687	1,000	1,111	1,800	47,447	64,312	1,05,262	1,34,919	1,36,564
Quinine and Salts—lbs.	1,07,523	1,30,459	1,19,567	1,13,637	1,33,795	28,08,734	30,96,160	26,25,239	23,42,186	24,47,075
Sarsaparilla and preparations ...	...	...	...	...	...	40,650	43,185	24,321	37,307	...
Storax	1,11,762	1,30,753	94,455	1,10,899	...	31,566	34,297	28,974	29,775	...
Saccharine ...	...	...	...	...	29,612	...	...	...	...	1,12,652
Proprietary and Patent Medicines	...	...	...	...	...	**25,06,303**	**24,15,232**	**27,29,228**	**29,26,782**	**42,83,667**
Other sorts of Drugs and Medicines ...	...	...	...	...	...	87,88,830	91,30,150	103,03,590	114,38,753	100,95,756
TOTAL ...	...	...	...	...	...	169,64,005	173,11,020	190,02,128	198,28,068	202,12,950

N. B.—1 Lac=100,000.

TABLE II.

Drugs and Medicines (including Chemicals and Narcotics) exported from India during five years from 1924-25 to 1928-29.

Name of Drugs Exported	Quantity					Value in Rupees				
	1924-25	1925-26	1926-27	1927-28	1928-29	1924-25	1925-26	1926-27	1927-28	1928-29
Asafœtida—cwts. ...	9	54	65	...	...	1,783	2,953	4,219	735	...
Champhor—lbs. ...	1,382	16	...	100	...	1,425	80	...	175	...
Cinchona bark—lbs.	5,59,592	4,86,187	80,691	1,73,529	1,38,104	2,12,712	2,45,398	43,460	90,002	78,024
Galangal—cwts. ...	188	519	536	633	575	5,157	12,662	11,915	14,096	12,850
Nux Vomica—cwts.	30,258	44,079	54,347	50,702	43,212	2,27,836	2,96,091	3,48,653	3,27,858	3,03,268
Senna—cwts. ...	47,544	44,995	49,117	52,814	46,995	10,74,678	8,93,052	8,93,052	9,48,812	8,60,208
Other sorts of Drugs.	...	...	...	...	...	19,83,384	2,22,711	24,03,426	20,11,689	29,06,142
Total Drugs and Medicines ...	...	...	...	...	...	35,87,425	36,77,347	37,10,220	34,53,367	41,60,988
Tea dust for manufacture of Caffeine —lbs. ...	32,39,907	30,00,969	15,91,330	41,14,638	...	4,90,644	5,50,983	2,63,810	4,41,671	...

N. B.—1 Lac=100,000.

from other countries. Gentlemen, with the help of science and capital, we can to a very large extent do without imports and it is possible to manufacture almost all our requirements in our own country. This will not only save the drain of India's gold but the development of this industry will open up a new avenue of employment for a large number of educated young men of our country.

Within the last 20 years—thanks to the enterprising spirit of some prominent chemists and medical men—the drug industry has developed extensively in India particularly in the provinces of Bengal and Bombay. Tinctures and spirituous preparations, liquid extracts, solid extracts, mineral acids, inorganic and organic metallic compounds and proprietary medicines have been prepared. Even organotherapeutic preparations like thyroid extracts, suprarenal and pituitary gland extracts and biological products like vaccines and sera have been produced. But there is an enormous field for further development. I will touch on one phase namely the possibility of production of some fine chemicals like alkaloids etc. to which attention might usefully be directed. I will give you a few instances to show that some of the basic alkaloids which are at present not being produced in India to any large extent and for which India has to look forward to other countries, can be economically manufactured here, if only sufficient attention is directed towards this aspect.

Atropa belladonna, the source of atropine grows in great abundance in the Himalayan ranges extending from Simla to Kashmir at an altitude of 6000 to 12000 ft. above the sea level and is also found wild in Kunawar at an altitude ef 8500 ft. An unlimited supply of the leaves and roots can be obtained from the Northern Himalayas from localities not too far away from places with suitable transport facilities. Apart from the natural sources, considerable quantities of the roots could be obtained from plants cultivated in various places in India. The Indian belladonna roots have been found to contain a higher percentage of total alkaloids (0·81 per cent) as compared with the standard (0·45 per cent) laid down in the pharmacopoeia. But it is strange to notice that large quantities of atropine and other medicinal preparations of belladonna are imported into India. Though the galenicals are now being prepared from these Indian roots, there is no reason why the alkaloid also should not be manufactured.

Another important source of atropine which has not been thoroughly exploited is the plant 'Datura'. Both *Datura stramonium* and *Datura fastousa* grow plentifully in the temperate Himalayas from Kashmir to Sikkim. It is particularly abundant in the outer Himalayas and covers s region of over 1,000 miles. In Bengal, *Datura* is found almost at the doors of every householder in the villages. Inspite of this, it is not utilised to any great extent and most of the stramonium preparations in the market are imported from outside. The atropine content of this plant is undoubtedly low but the plant grows so abundantly in easily accessible localities that it would be worth while to attempt extraction of the alkaloids from the plant.

Strychnos Nux Vomica (Vern.—*Kuchila*) grows wild and plentifully throughout tropical India up to an altitude of 4000 ft. above the sea level. It is particularly abundant in the Madras Presidency, Cochin, Travancore and in Orissa. In Orissa, particularly in the Mayurbhanj State, Nux Vomica trees flourish and a good export trade in the seeds is already existing. The total exports from India approximate about 45,000 cwt. to 50,000 cwt. annually valued at Rs. 300,000 (3 lacs) almost entirely to Great Britain. Galenicals like tinctures and extracts and purified alkaloids—strychnine and brucine—are manufactured there and sent to India for use. The value of the imported refined products is nearly 100 times greater than that of the exported nux-vomica seeds. It would appear from the figures I am putting before you that strychnine manufacture on a large scale from the seeds growing in India would amply pay its way and leave a handsome margin of profit. The nux-vomica seeds are sold in Orissa at Rs. 1-4 0 per maund of 105 lbs. delivered, washed and dried at the buyer's godown. These very

seeds are sold in Calcutta at Rs. 4 to 5 per-maund of 82 lbs. due to the high transportation charges by the railways. The European manufacturers, on the other hand, get the same article landed there at probably much less cost as the shipping companies carry this commodity as ballast at very low freight. If the seeds are available in Calcutta at a cheaper rate or if factories are erected near the source of supply of the drug *e. g.*, in Orissa, strychnine could be easily manufactured at competitive prices. It has been calculated that one cwt. of seeds worth about Rs. 5 would bring nearly 20 oz. of strychnine worth about Rs. 25 at the present market price of strychnine. There is a good demand of strychnine on the market as, apart from its medical use, it is largely employed as insecticide and as an animal poison.

Ephedrine is another instance in point. Few drugs of recent years have attracted so much attention of the medical profession as ephedrine, the alkaloid of *Ephedra vulgaris*—the Chinese plant 'Ma Huang'. As the plant was originally found in China, she got practically the monopoly of the extensive trade in the drug on account of the growing demand for the alkaloid ephedrine in therapeutics. This trade in ephedra flourished to such an extent that a special mention was made in the report of the Vice-consul for Tienstin, China. In the first seven months of the year 1927 477,218 pounds of ephedra valued at $53, 652 were exported to America alone. *E. vulgaris* and allied varieties of Ephedra grow fairly extensively in India. Nobody took any notice of the huge possibilities existing in this direction. Researches carried out at the Calcutta School of Tropical Medicine have shown that the Indian ephedras are similar in almost every respect to the Chinese varieties and may be safely used in therapeutics. Probably in response to these findings, Indian ephedras are already finding a recognition in the market. In the year 1928-29, nearly 2000 maunds were exported outside India. If Indian ephedra is used for the manufacture of ephedrine, India may become completely independent of the foreign sources. It is happy to note that ephedrine from the Indian Ephedras has already been produced by Messrs. Bengal Chemical and Pharmaceutical Works Ltd.

Emetine is another drug which can be easily prepared in our country. The demand for emetine is very extensive indeed. *Psychotria ipecacuanha*, the source of the alkaloid, is however not a native of India but has been acclimatised in the Indian soil long ago. It has been cultivated successfully in the Bengal Government Cinchona Plantations at Mungpoo and also in the Nilgiris and the Karen hills of Burma. Though plantations in the Nilgiris have been discontinued, the plants have flourished in Burma and Bengal. It appears from the reports of the plantations that good quality of roots could be obtained in India having a total alkaloidal content, almost equal to the imported Brazilian roots. Emetine in a pure condition has already been obtained from the Indian ipecacuanha and if more attention is paid, India ought to be able to supply her now rather extensive demands and may even contemplate an export trade in this drug.

Gentlemen, I think all of you will agree with me that both for the prevention and treatment of malaria, a much wider distribution of quinine is necessary. At present the high price of quinine militates against this. The total annual consumption of quinine in India is estimated at 200,000 lbs. of which only 42,000 lbs. are manufactured in the country. (Report, Drugs Enquiry Committee. Government of India Publication). In these circumstances, the Indian price is determined by the world price and this, as is well known, is a monopoly price owing to the fact that 90 per cent. of world's supply of quinine comes from Java. If India has to embark on any large campaign for fighting malaria, it will first be necessary to reduce considerably the price of quinine within India and this can only be effected if India is self-supporting in production. To achieve this self-sufficiency, a considerable extension of the present area under cinchona will be required. (Report, Royal Commission on Agriculture. Government of India Publication). The difficulty however is that *cinchona*

succirubra which grows well in India, does not contain a good percentage of quinine. *Cinchona Ledgeriana*, the most valuable species, from the point of view of quinine content, is difficult to grow as it can stand neither frost nor high temperatures. But the plant hybridisis readily and promising natural hybrids have been found. It is hardly open to doubt that, if private capitalists take up the work in right earnest, varieties of cinchona could be produced which will give a better yield of quinine. Development of quinine industry is certainly worth while in a malarious country like India.

Santonin is another very important drug which may be economically produced in India. Practically all the santonin in the market is derived from *Artemesia maritima* growing in the Kirghiz in Russian Turkestan. Many species of Artemisia grow in the Himalayas, particularly in the valleys of Kashmir. Within recent years, a new source of santonin has been discovered in the Kurram valley in the N. W F. Provinces. A very large area amounting to about 2500 acres is found thickly covered with the plant. These areas are not difficult to reach and transport charges are not likely to become a heavy item of expenditure. Though the Kurram valley Artemesia has been found to yield a smaller percentage of santonin than the Russian varieties, production of santonin will nevertheless be remunerative in view of the abundance and cheapness of the raw material. Santonin is a very expensive drug and if this industry is developed, it will be highly beneficial to the poor worm-infested patients of India.

Caffeine is another important drug in the armamentarium of the physician. It is the principal alkaloid occurring in tea and coffee plants. In India, both these plants grow luxuriantly. Coffee is grown principally in Madras. Coorg, Mysore, Travancore and Cochin. The total area under cultivation in 1929 was 160,800 acres. The total area under tea cultivation, however is much larger—788,800 acres in 1929. Next to China, India is the largest tea-growing country in the world. An estimate of the quantity of tea produced may be obtained from the fact that in the year 1928, 355·5 million pounds of tea alone were exported (Reports, Indian Tea Association and Tea Cess Committee). Besides this, nearly 50 to 60 million pounds of tea are consumed annually in India and Burma. Inspite of these resources, it is indeed disappointing to note that the alkaloid caffeine is not produced here. Indeed, it is not necessary to use good tea suitable for human consumption in the manufacture of caffeine. In the preparation of finished tea for the market, a large amount (from 1 to 5 per cent) of fluff and sweepings (tea-waste) is left over. Caffeine can be and is usually manufactured from these damaged tea or tea-waste. If caffeine is only manufactured from the tea-waste derived from the quantity of finished tea exported, nearly 57,300 lbs. of caffeine could be produced which would fetch nearly 65 lacs of rupees at the present wholesale market price of the drug. The demand for caffeine and its salts is quite large and there is no reason why India, the largest tea-exporting country of the globe, should not produce her own caffeine. From theoretical considerations, she should hold the key to the caffeine industry of the world.

I have tried in the short space of time at my disposal to present before you the economic aspects of some of the Indian indigenous drugs. Those who are interested in this aspect of the problem are referred to a book which is shortly to be published from the Department of Pharmacology by Colonel CHOPRA, the President of this meeting. I have only indicated in brief the possibilities that are present. I am fully aware that the manufacturers will have to face a good deal of difficulties in the actual working out of the problems. As a member of the staff of the Drugs Enquiry Committee of the Government of India, I have had the unique opportunity of visiting all the big pharmaceutical establishments in the different parts of India and I maintain, with the equipment already existing and possibly with slight improvements, India can do much more than she has already done.

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(Paper read before the Medical College Reunion under the Presidentship of Lt. Col. R. N. Chopra, M. A., M. D., (Cantab). I. M. S.).

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Editorial Comments

The Tuberculosis Association of Bengal has just issued its report for the year 1931. It contains several points of interest. This Association was started some three years ago for the study and prevention of tuberculosis in Bengal. The necessity of such an institution was forced upon the public mind because of the very high incidence of tuberculosis in the province. We understand that on a conservative basis there are a million infected cases, and the mortality rate is graphically described as twelve deaths per hour. We may be quite certain that the economic depression resulting in widespread poverty and ill-nourishment in a population that is always undernourished, has given a further impetus to tuberculosis. These facts are appalling and when regard is had to the vast population of Bengal, some 45,00,000 people and to the great extent of the country, some idea can then be formed of the field open for anti-tuberculosis work in the province. We have not worked out the serious economic loss that is involved, but it must amount to several crores of rupees. No estimate is possible of the deleterious effects on the whole life of the province, but it is known that tuberculosis saps the vitality of the people to a demoralising extent. The problem is so wide and so intense, that the efforts of the Tuberculosis Association bear little or no relation to the whole.

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The Association started with and still retains a large official and non-official backing and it is a matter of some surprise that it has not been able to command much greater assistance in funds both from Government and the public. Comparatively small results can be expected from a total income of some Rs. 13,000, made up mainly by membership subscriptions and donations. How much in any case can be expected from these sources? In our view a body of this description, with the enormous problem it has to deal, cannot perform any really extensive services without Government aid. In these days of large deficits in the budgets of all Governments, it is almost presumptious to suggest Government assistance, but the fact cannot be denied that unless Government assistance is secured the work of tuberculosis prevention will not proceed sufficiently in keeping with the needs of the situation. Perhaps something could be done in the matter of funds both from the Government and the public if the situation were forcibly brought home to them. Apart from the economic loss, there is always the risk to which every man, woman and child is exposed and who in their own interests would, if they were made to realise the dangers they run, be only too willing to subscribe towards anti-tuberculosis work. But, here also, there is need to convince the public that real service is being done and if steps are not taken in this direction there is every probablility of the public turning round at a later date and asking such a body as the Tuberculosis Association to justify its existence, for the results before us are so unimpressive, even in the limited sphere of its activity, that it is difficult to make out any strong case for the continuation of the Association. And yet we think that to abolish the Tuberculosis Association of Bengal would be a pity, for there are before it great opportunities for work that will be an undoubted blessing to the province.

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The Association has three health centres in Calcutta one at the Chittaranjan Hospital, another at the Howrah General Hospital and a third at the Medical College Hospital. The medical examination of patients is carried out at these centres and treatment given; in some cases milk, fruit and other nourishment is supplied. Unfortunately, as the report states, "the nourishment fund only permitted of this work being carried out on a few cases and over a short period of time." Some of the cases cited are most

interesting. The Association seems impressed with the importance of its preventive work and its visitors have been extremely active in keeping touch with cases and instructing in methods of prevention. This is all to the good and the number of patients is on the increase, but it is very insignificant when comparison is made with the total incidence. The Association seems to have been most active in the holding of lectures on preventive methods, and no doubt this publicity work will be extended with the grant expected from the King George's Thanksgiving Fund. Incidentally, it passes our comprehension why subventions from this fund should be confined solely to propaganda work when there is such great need for development in other departments.

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There is one criticism to which the Tuberculosis Association laid itself open unnecessarily and that is an apparent inability on the part of some of its officials to appreciate the work of others in the same field. It was, in our opinion, unnecessary to launch an attack on the occasion of the last annual meeting of the Association against the Calcutta Corporation (whose assistance it invokes at the same time), and in the case of the Jadabpur Tuberculosis Hospital it was left to His Excellency the Governor to make a graceful acknowledgment of the work of that deserving institution. We think a spirit of helpfulness, co-operation and constructive criticism should actuate the members of the Tuberculosis Association.

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We take this last opportunity of reminding our readers of the All-India Medical Conference to be held at the Town Hall, Calcutta on 24th March. Preparations in all sections are well advanced and a most successful conference is promised. Unfortunately, the Conference will be without the able assistance of DR. JIVRAJ MEHTA and DR. ANSARI, who will undoubtedly be missed.

ALL-INDIA MEDICAL CONFERENCE

EIGHTH SESSION.

Sir Nilratan Sircar, Kt., M.A., M.D., D.C.L., has been duly elected President of the forthcoming All-India Medical Conference to be held in the Town Hall, Calcutta, on the 25th, 26th, 27th and 28th March, 1932. At a meeting of the Reception Committee, Dr. B. C. Roy, M.D. (Cal.), M.R.C.P. (Lond.), F.R.C.S. (Eng.), Mayor of Calcutta, has been elected Chairman of the Reception Committee.

PROVISIONAL PROGRAMME.

25th March, Friday:

12 A.M. TO 2 P.M.—Opening of Conference; Welcome address of the Chairman of the Reception Committee; Presidential Address; Formation of the Subjects Committee.

2 P.M. TO 4 P.M.—Scientific Section.

4 P.M. TO 7 P.M.—Demonstration and Entertainment at Messrs. Bengal Chemical and Pharmaceutical Works, Ltd.

8-30 P.M. TO 10-30 P.M.—Subjects Committee.

26th March, Saturday:

8 A.M. TO 10 A.M.—Visit to Institutions and Subjects Committee.

10 A.M. TO 12 NOON.—Interval.

12 A.M. TO 4 P.M.—Conference Resolutions.

4 P.M. TO 5 P.M.—Interval (for Tea); Group Photograph.

5 P.M. TO 9-30 P.M.—Scientific Section.

27th March, Sunday:

8 A.M. TO 10 A.M.—Visit to Institutions and Subjects Committee.

10 A.M. TO 12 NOON.—Interval.

12 A.M. TO 4 P.M.—Conference Resolutions.

4 P.M. TO 6 P.M.—Entertainment at Messrs. B. K. Paul & Co.'s Garden House.

6 P.M. TO 8 P.M.—Annual Meeting of the Indian Medical Association.

8 P.M.—Dinner followed by Cinema demonstration.

28th March, Monday:

8 A.M. TO 10 A.M.—Scientific Section.

10 A.M. TO 12 NOON.—Conference—Conclusion—Vote of thanks

The exhibition in which most of the leading manufacturers of medical requisites are taking part will be opened on the 24th March.

Medical News and Notes

[Items of news and notes of general interest to the profession for incorporation in this section from the members of the profession will be greatly appreciated—EDITOR]

Recognition of Indian Systems of Medicine. In the Madras Legislative Council MR. DANIEL THOMAS moved the Bill to amend the Madras Medical Registration Act of 1914, on January 27th, 1932. The object of the Bill was to remove the untouchability of the practitioner of the Indian systems of medicine, to which due recognition had been given by the Government by maintaining a school for Indian systems of medicine. The Bill was intended to make possible free professional exchange of ideas between qualified practitioners of both the Indian and Allopathic systems of medicine. Such an anomaly did not exist in the Acts obtaining in the provinces of the Punjab and the United Provinces.

DR. NATESA MUDALIAR supporting the motion, said that indigenous practitioners who served about eighty per cent. of the people of the land were being treated as untouchables of the profession by the allopathic practitioners who considered themselves as 'seraphi illuminati.' Even if the indigenous practitioner wished to consult an allopathic doctor, the latter considered it *infra dig* for him to give advice. The students in the School of Indian Medicine were given training in almost all the subjects which were taught in other medical schools or colleges, and were efficient in the subjects taught. It was the duty of the present Ministry to enable this body of medical men to gain recognition and status through registration.

The Hon'ble SIR MAHOMED USMAN stated that a pertion of the proposed bill was not acceptable to Government as it stood and if proper amendments were made thereto or it was deleted Government would have no objection to the measure.

The motion was put to vote and accepted and the Bill was referred to a Select Committee.

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Ambulance Car to Municipality. DR. MANGALDAS V. MEHTA, Honorary Secretary of the Bombay Presidency Infant Welfare Society and a member of the Municipal Corporation, presented a well-equipped ambulance car to the Municipality for the purpose of conveying maternity cases to hospitals or maternity homes. The car has been received by the Corporation who had long felt the absence of such a suitable provision on the following conditions :

(1) The Municipal Corporation should maintain the ambulance.

(2) The ambulance should be used solely for the purpose of conveying maternity cases to the hospitals or maternity homes without any charge.

(3) Preference should always be given to cases from the north of the City.

(4) The ambulance should be located in a convenient centre preferably in the north of the City.

It is expected that a woman in labour will receive hardly any shock when the car is in motion. It is fully equipped with cold water (running) and wash basin. Arrangements will be made to have a trained attendant, a nurse or an ayah, to accompany the patient in case of emergency.

The presentation of DR. MEHTA will be appreciated particularly by the residents of the northern part of the City where in recent years some patients were delivered in moving cars or gharries.

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Medical Students' Union Banned. The Government of Bengal have communicated to the Superintendent of the Dacca Medical School their decision that the Students Union of the school is not a 'bona fide' union but a political association and should, therefore, be dissolved. The communication adds that any student having connection with the Union will be liable to expulsion.

As soon as the Government decision was communicated to the students, they informed the Superintendent that the Union was dissolved.

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Knighthood for Lt. Col. Hasan Suhrawardy. His Majesty the King Emperor has been graciously pleased to confer Knighthood on Lieutenant Colonel HASAN SUHRAWARDY in recognition of the great gallantry which he displayed upon the occasion of the attempt on the life of His Excellency the Governor of Bengal at Calcutta University on Feb 6 last.

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Leprosy scourge in Midnapore, Bengal. The terrible prevalence of leprosy in a certain area in Midnapore, regarded as being one of the most high endemic districts in India., is vividly illustrated in a report prepared by DR. K. R. CHATTERJEE on leprosy survey work in the Salbani Police Station area.

The investigations disclosed the following facts :—Of 5,600 families, 708 families, or 16·6 per cent, were infected with leprosy. Over 430 families had one leper among them. One family included no fewer then 10 lepers. Out of a total population of 56,835, there were 793 lepers giving an average of 1,395·4 cases per 100,000 of the population and 3·7 cases per square mile. The high incidence of the disease is attributed mainly to the villagers' diet of rice and less digestible froms of dal, the lack of milk and vegetables, and the eating of decomposed fish and meat.

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Bogus Medical Hall. DALEEPSING and BESHAMBRE DASS were sentenced on charges of cheating the public to three years' imprisonment each. The prosecution alleged that the accused opened a medical hall in Hira Mandi, Lahore, and branches in various districts of the Punjab and employees were appointed on security to run these. But, it was also alleged, no medicines were sent to them. After waiting for a considerable time some of the employees came to Lahore and demanded their securities back. When they were refused they lodged three complaints against the accused.

The accused were each sentenced to one year's imprisonment in each of the three cases, the sentences to run consecutively.

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Normal for Baby to Cry. Crying is the normal occupation of the baby. Justice ARCHAMBAULT made this decision in Montreal in dismissing an action brought by a housing estate company against the father of a baby for cancellation of his lease on the grounds that the crying of the child was a nuisance to the neighbouring tenants. Evidence was given that the child was in normal health and that its crying was only the natural exercise of a pair of healthy lungs.

The father said that he had done everything to see that the baby, 18 months old, was in good health. He declared that if it persisted in crying it was one of the ills which humanity is heir to and which should be borne with good grace in the common interests of the race.

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Young Man's Pose as Ship's Doctor. CHARLES JOHN POWELL, aged 21, wanted to go to Australia. So "borrowing" a doctor's name he signed on as a ship's doctor and went there. On the voyage he attended successfully to several cases ; and he came back on another ship belonging to the same line. His story was told in full at the West Ham Police Court when he was fined £5 and £3 3s. costs, or 31 days' imprisonment, for pretending to be a doctor and a surgeon contrary to the Medical Act. POWELL had some sort of medical training as a hospital attendant, and he applied for a post as a doctor on a Commonwealth and Dominion Line ship, going to Australia, giving the name of a DR. DUNCAN PICK, M.B., Ch. B.

He was eventually posted to the Port Denison and on the voyage to Australia he attended to a number of patients. He returned to England on another of the Company's steamers.

It was revealed that the youth really came back to attend the captain of the second ship, and the treatment he gave was good. He signed on the ship at 1s a month and his food. The Magistrate told POWELL that if anything had happened to the people on board it was pretty clear that he might have been charged with manslaughter.

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Doctors Old and New. "Doctors old and new" was the topic selected for discussion at the dinner of the University Board of the Lyceum Club.

SIR ARTHUR KEITH remarked that there was nothing to fear about the young men and women of to-day. They were as good as those of pre-war days ; nevertheless, there was an essential difference between young medical men and women of to-day and those of, say, 40 years ago.

The difference was created by the fact that the practice of medicine had become so big that we had lost the general practitioner.

People had been led to suppose, said SIR ARTHUR,that if anything was wrong with them they must see a specialist. That was killing the general practitioner and was a great danger in medicine. At the present time it tended to make the young practitioners less self-reliant in judging the body as a whole.

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Radium "Bomb" for Treating Cancer. A disappointing report has been issued by the Radium Commission on the results of a year's trial of a four gramme "Bomb" of Radium acquired by the National Radium Trust.

The "Bomb" was allocated to Westminister Hospital with the stipulation that preference should be given to cases of malignant disease in regions of the heart, stomach and prostate. The results confirm that these forms of radium therapy, under present conditions of knowledge, cannot be recommended for the treatment of cancer in these regions. Nor were better results obtained in a few cases of deep-seated cancer of other organs in which this method was tried. It is, therefore, felt that continued use of the "Bomb" in its present form is unwarranted.

The Commission, however, realise the excellent results which Radium Therapy often achieves in certain regions of the body and say that even where permanent cures cannot be expected, alleviation of the pain makes the use of radium well worth while.

It is considered that five years must elapse from the inception of the present National Research Scheme before a confident verdict can be given.

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Prison For Doctors. The sensational trial at Lubeck of three doctors and one nurse, charged with criminal responsibility in respect of the death of seventy seven children after the administration of Calmette treatment, has just ended.

Doctor DEYCKE was sentenced to two years' imprisonment and Doctor ALTSTAEDT to fifteen months for criminal negligence in administering the treatment. The other accused, Doctor KLOTZ and Nurse SCHUETZE, were found not guilty.

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Queer Court Case. Five years ago a doctor who lives at Toulon performed an operation on a Russian patient. The operation was successful, and the patient was so grateful that he wrote to the doctor saying :—"If at any time you should need money, you have only to come to me and I will give you 100,000 francs".

A little while ago the doctor met with a serious accident which necessitated the amputation of both of his legs. Consequently his practice dwindled and he found himself in financial difficulties.

He went to his former patient and asked for the hundred thousand francs which had been promised, but they were refused, whereupon the doctor brought a suit against him.

A Toulon court has just ruled that the money must be paid to the doctor. (*The Medical World*: 22nd January 1932.)

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The Robert Koch Celebration. March 24, 1932, will be the fiftieth anniversary of the discovery by ROBERT KOCH of the tubercle bacillus. The Federal Minister of the Interior and the Minister of the Prussian Department of Welfare have taken the initial steps to inaugurate suitable ceremonies in commemoration of the event. A commemorative assembly will be held in Berlin. On May 18, there will be a special commemorative session, in which German and foreign scientists will participate, and on May 19 and May 20 further scientific sessions will be held. It is planned also to reorganize the ROBERT KOCH foundation that was disorganized during the inflation period, and above all, the importance of KOCH as a scientist will be brought before the people in a suitable manner. Reich's President V. HINDENBURG has consented to serve as the patron of the undertaking and the imperial Chancellor will be the Honorary Chairman of the Committee on arrangements. In addition, a Committee to aid in the organization of the scientific assembly will be appointed, to consist of German and foreign scientists and investigators.

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Surgical Operation Without an Anaesthetic. The grim details of a serious surgical operation performed by a layman in the ice covered interior of Greenland, without an anaesthetic and with only a clasp knife and a pair of scissors for instruments, have been revealed according to "The Times of India" by GEORGI, a member of the Wegener Relief Expedition, who has reached Denmark after more than a year in the Arctic.

DR. GEORGI, who is a doctor of science without any medical or surgical knowledge, was forced to spend the winter with DR. LOWE and DR. SORGE, two other scientists of the relief party, at Ishulen, one of the most exposed areas of the ice-covered table land of the interier.

In the terrible weather of January DR. LOWE became badly frost-bitten in both the feet. Even to the elementary first aid knowledge of the others, it was evident that only by amputation of all the toes could his life be saved. The meagre medical aid supplied contained no anaesthetic. The clasp knife and scissors were the only available instruments.

In an operation lasting an hour and a half, with DR. LOWE tied and held down by DR. SORGE, DR. GEORGI amputated the toes of one foot. The patient's agony throughout the ordeal was terrible but he never uttered a moan.

A week later the toes of the other foot were similarly amputated.

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The Medical Records of Deceased Physicians. The French medical societies have been solicited by a circular letter of Professor TANDLER of Vienna to investigate and to report to the press the interest that the public has in the disposal of medical records of deceased physicians, with a view to preserving the right of privileged communications. Most physicians preserve in their office the record cards setting forth the pathologic peculiarities of their patients. The record-cards of hospitals are preserved in archives. The record-cards of a private clientele may, after the death of a physician, if he has no successor, find their way into the hands of the public through the sale of his furniture, or they may come into the possession of a servant. The servant, or any one purchasing a filing case, may thus threaten to make known, for example, that a certain person, well known

in politics or society, has been treated for syphine addiction, kleptomania or sexual anomalies. To prevent such consequences, Professor TANDLER suggests that, on the death of a physician, his record-cards and other records of observations on his patients be immediately placed under seal and transmitted within a reasonable time to the headquarters of a medical association, where they cannot be consulted without an official permit, and then after the lapse of ten years that they be entirely destroyed. The patients would thus be assured that the secrets that they confided to their physician cannot fall, at the death of the physician, into the hands of unauthorized persons. This question of the disposition of the record-cards of a physician after his death deserves to be given consideration in the medical journals of all countries and it is surprising that there has not been some discussion on the subject at some of the professional assemblies.

Case Note

A Case of Gastric Ulcer (?)

By K. C. GHARPUREY, M.S., Bombay.

Name	.....
Age	20.
Sex	Male.
Occupation	Student.
Caste	Goanese Christian.
Address	Central Jail, Yervada.

Date of Admission :—

28-8-31 on the Medical side.
5-9-31 on the Surgical side.

Admitted for pain in the abdomen and for haematemesis.

Family History : Parents and grand parent living and in good health. Patient has five brothers and three sisters, all living in good health.

Personal History : Patient is a hard smoker. Used to take alcohol occasionally. Diet mixed. Suffered from typhoid when he was 12 years old. Had an appendicular attack one-and-a-half year previous to his admission for which he was operated in the Sassoon Hospital, Poona.

O. D. P. : Nine months before his admission in the Hospital patient started getting vomiting 20 minutes after his food. At the beginning these attacks occurred only once in three or four days. After a month patient noticed heaviness after food. He used to feel relieved of this heaviness whenever he vomited. At this time haematemesis was noticed occasionally—that too in traces. After every vomit which contained only food without any bile, patient used to get acid taste in the mouth and burning in the cardiac epigastric region. After some time he used to get relief from this trouble. After two months the attacks of vomiting began to get frequent. With the frequency of vomits patient noticed pain in the abdomen. Up till now patient was treated as a dyspeptic case being kept on a very bland diet.

When patient started getting pain, the pain used to appear exactly after 20 minutes of his taking food, which he used to vomit. Vomiting relieved his pain. Pain was noticed on the left side of the epigastric region at the tip of the 10th costal cartilage. It was of a stabbing character and was conducted to the back. Haematemesis was noticed only occasionally even at this time. Patient was treated in the prison for all these complaints. He was given only milk and got some powders by month.

He was admitted in the Hospital on the Medical side first because his pain and vomiting grew worse. Pain was so severe that patient used to be afraid of taking food. Haematemesis also became frequent before his admission. After a brief stay in the medical side during which time the haematemesis got worse, patient was transferred to the Surgical side in my wards with a probable diagnosis of gastric ulcer.

Patient suffered from obstinate constipation. Since his illness for the relief of which he used to take enema, flatulence was noticed two months previous to his admission. He also suffered from loss of sleep and eructation at times.

Patient's weight in prison was 136 lbs. while in the Medical side he weighed only 110 lbs.

General Examination : Patient looked very emaciated.

Pulse, temperature and respiration : normal.
Conjuctiva and nails—very pale.

Examination of the Abdominal System :

Tongue—moist and clean.
Teeth—very dirty and carious.
Gums—spongy and bleeding on pressure. Pus also was noticed on pressure.

Examination of the ear, nose and throat was done by DR. MANDIK, but nothing abnormal was noticed. Abdomen was sunken, movements regular. Palpation—liver 3 finger breadth enlarged downwards. Spleen not palpable. There was deep tenderness at the epigastric region left side at about the 10th costal tip. No swelling seen or no tumour felt.

Percussion : Liver dullness increased only downwards, 3 finger breadth. Otherwise nothing abnormal.

P. R.—Normal.
Respiratory system—Normal.
Cardiac system—Normal
Nervous system—Normal.

Urine was examined and nothing abnormal noted.

Gastric contents : It showed total and free acids which were almost normal without any abnormal things.

Wassermann was negative.

X'ray examination could not be done as the patient was vomiting incessantly at this time any little thing he took. Half an ounce of dark blood was vomited four times in a day. With a probable diagnosis of chronic gastric ulcer patient was put on the following line of treatment :—

Feeds. Only milk every two hours, only two ounces, immediately followed by 4 drs. of olive oil. After 10 minutes of every feed patient was given the following powder :—

Mag. carb.—10 gr.
Bis. carb.—10 gr.

Atropine sulph. gr. 1/100 was injected twice a day.

Even this treatment had no effect on his pain, vomiting and haematemesis. The patient began to get worse day by day and was so weak that he could not even sit up in bed. We, therefore, put him on nutrient enema with saline subcutaneously. He required now an injection of atropine, morphine every night for his sleeplessness and pain in the abdomen. We waited in this way upto 12th Sept. 1931, *i.e.* about a week since his admission in the Surgical Ward and decided to take bold measures. So on the 12th Sept. 1931 patient was put up for laparotomy which was done under chloroform with ether. On opening the abdomen which was done by a left paramedian incision starting from the epigastric angle to the umbilicus, we noticed the veins of the stomach, gastri-colic and great omental veins very much distended. Liver was enlarged three fingers breadth below the costal region. On palpation it was of normal feel. There was no evidence of any ulceration on the anterior or posterior surface of the stomach. Lesser and great curvatures were normal. Duodenum was normal. Gall bladder and its duct and cystic ducts revealed nothing, abnormal. There was no tumour felt anywhere to account for the distension of the gastric veins. Kidneys were in their place quite normal. SPLEEN WAS NOT ENLARGED. We closed the abdomen stitching the great omentum to the anterior abdominal wall because we decided on the table that it was a case of cirrhosis of the liver.

Patient was taken to the ward. After coming round he started haematemesis which was just the same as prior to operation. We continued saline subcutaneously and also the nutrient enema. He required injection of atropine and morphine every night for four successive days for his sleeplessness and pain. There was no improvement in his condition and in the symptoms and we gave up that case as a hopeless one, only waiting for the death of the patient which we thought would carry him off in a week or so. I came as usual to the ward on the morning of the 16th *i.e.* on the 5th day after the operation. Sister of the ward took me to see this patient first and begged me to do something for him as his condition appeared dreadful. We all were much concerned about his health as we liked the patient, he being intelligent, young and educated. Suddenly I thought of changing my treatment and ordered the Sister to feed the patient on a piece of bread and butter. Every one around looked surprised at me and both the Sister and the patient said that it could not be possible as the patient could not even retain a spoonful of water. Patient said he would die if he were to take that piece of bread ; yet I persisted and said that it was my order that the patient must be given that piece of bread and butter that very afternoon. Next day I came in the morning as usual but it being my operation day, I went straight to the operation theatre and there Sister came to report to me that patient took the piece of bread that was ordered and that he had no vomit, no pain and no hæmatemesis since then. I could not myself believe the sister for a moment and I thought she was joking at me. But I found that it was all true and told her to carry on with the same diet. Since then patient never vomits had no pain or haematemesis and never required any morphine injection for his sleep. He improved in his health gradually. On the tenth day after his operation we removed all his stitches. The patient was in the ward for 41 days after his operation during which time we got all his teeth removed. On the 42nd day of his operation we discharged the patient as cured and sent him back to the Jail authorities. At the time of his discharge patient was walking about everywhere, he was eating everything that he liked and there was no complaint of pain, vomiting haematemesis, sleeplessness or constipation.

I phoned to the Jail authorities about the patient's condition on the 27th January 1932 and I was told that he was in the best of his health.

I still wonder why that piece of bread should have brought such a magic change in the patient's dreadful state. I cannot understand what made me think of that piece of bread at that very moment. I only had read that some hysterical vomiting do stop when the patients are given solid diet and that was the only thing that made me give him that piece of bread which was undoubtedly a life saving measure.

Annual Reports

King Edward VII Memorial Hospital and the Seth Gordhandas Sundardas Medical College, Bombay.

The following are extracts from the administration report of the above for the year 1930-31.

The Hospital.

The question of the purchase of Radium and Deep X-Ray Therapy Apparatus was considered by the Corporation, but had again to be postponed for financial stringency. Thanks, however, to the philanthropy of the Wadia Charities, whose Trustees have made a generous donation of Rs. 25,000 for the purchase of Deep X-Ray Therapy Apparatus, it would be possible to purchase the necessary apparatus and instal it next year. The Corporation have gratefully accepted the donation and the Deep Therapy Department will be known as "N. M. Wadia Deep X-Ray Therapy Institute" after the original donor. For the purchase of Radium the Hospital look forward to some generous-minded donor. The minimum amount necessary for its purchase is Rs. 25,000, though it would be far better to have a larger quantity of Radium as it is more effective when administered in large doses.

The work of constructing the Skin and Venereal Wards was completed during the year under report. The opening of the wards has, however, been held up as the provision of funds required for its equipment and for the engagement of the staff could not be sanctioned on account of financial stringency. It may be added that half the cost of equipment of the wards will be borne by the Governor's Hospital Fund.

The work of constructing an extra storey over the Nurses' Annexe has been carried out during the year under report. This has rendered it easy to reduce congestion in the Nurses' Home.

The work of the extension of the Surgical Dressing Section in the Out-patients Department was started during the year under report and is well progressing.

Of the total number of 9,445 in-patients under treatment (9,117 new admissions *plus* 328 patients in residence on the 1st January 1930) in the Hospital during the period under report, 3,997 were cured, 3,115 were discharged as relieved, 963 either absconded or left the Hospital against medical advice and 1,012 died, leaving a balance of 358 patients in the Hospital at the end of the year. Out of the 1,012 deaths, 140 died within 24 hours of admission into the Hospital.

Excluding the amount spent out of the loan funds, the total expenditure incurred on the maintenance of the Hospital during the year 1930-31, including liabilities outstanding at the end of the year, approximately amounts to Rs. 5,26,572. This expenditure includes the cost of the maintenance and treatment of in-patients, the cost of the Out-patient Department, of the resident medical, nursing and menial staff as well as that of the administration and of maintenance and repairs of buildings. The cost per in-patient per day comes to Rs. 3-3-9 and that for each out-patient, to Re. 0-8-1 per outdoor attendance, *i. e.*, about Re. 0-2 8 per medicine day including the cost of drugs, surgical dressings, skiagrams, establishment charges, etc. The cost of diets including that of extras and stimulants works out Re. 0-9-8 per in-patient. per day. The average cost to the institution for every in-patient admitted works out at Rs. 45-8-2; while that of every new outpatient admission works out at Rs. 1-8-3 in all.

With the reorganisation of the Aural and the Skin Sections of the Out-patient Department, two good units can now be said to have been provided. The Aural Section has now got its own Operation Theatre; but owing to its distance from the Surgical Wards, much inconvenience is felt in carrying patients operated upon from the Aural Operation Theatre to the wards. If a small ward for Tonsils and Adenoids could be constructed in the open space adjacent to the Aural Department it will afford much convenience to the patients and to their relatives. There will be practically no extra cost of managing such a small ward as the children operated upon in the morning for Tonsils and Adenoids will be allowed to go home in the afternoon. Though the Skin and Venereal Section has now more floor space than was the case over a year ago, the department is always considerably congested. It would be necessary to find some ways and means of securing for it better accommodation.

Arrangements made with the Maratha Hospital and the Turner Sanitorium for the transfer of patients suffering from Pulmonary Tuberculosis were continued during the period under report. As many as 316 patients suffering from advanced tubercle were transferred to the Maratha Hospital, often direct from the medical out-patient.

The question of laying down a scale of fees for well-to-do patients attending the Hospital was considered by the Corporation, but before laying down such a scale it was decided to approach Government with a request to amend the Municipal Act empowering the Commissioner to refuse admission in Municipal Hospitals to well-to-do patients who, in his opinion, could afford to pay for their treatment outside the Municipal Hospitals. Steps are being taken to

draft the necessary amendments to the Municipal Act for the approval of the Corporation.

The Poor Box Charity Fund from which relief is rendered to poor patients by providing them with spectacles, crutches, trusses, artificial limbs, travelling expenses, etc., has received steady support from the public and from the patients who have been benefited by their attendance at the Hospital.

THE COLLEGE.

The following table shows the number of post-graduate students sent up under different groups for this examination, in June 1930, with their results :

		Students sent up.	Passed.
M. D. Branch	I (General Medicine) ...	2	1
,, ,,	II (Pathology) ...	1	1
,, ,,	III (Midwifery) ...	4	...

M. S. Examination.—Of the 5 candidates sent up for this Examination, 3 were successful.

D. O. Examination.—Of the 2 post-graduate students sent up for this Examination, one was declared successful.

Thanks are specially due to SIR WILLIAM HALE WHITE, Consulting Physician, Guy's Hospital, London, for his kind thought in presenting the College Library with 33 bound volumes of the Clinical Society's Transactions from 1868 to 1907, and of the Medical Society's Transactions from 1909 to 1930. These sets of old journals are particularly welcome, as the College Library possesses, so far, very few back numbers of important journals or proceedings of important societies.

During the year under report, three different enquiries were, under progress, under the auspices of the Indian Research Fund Association :

(1) *An 'enquiry into the nutritive value of Indian Vegetable Foodstuffs.'* As the Indian Research Fund Association extended the grant during the year 1930-31, the work on the nutritive value of Indian Vegetable Foodstuffs was continued in the Physiology Department.

The detailed results of the above investigations have been submitted for publication, in parts, in the Indian Journal of Medical Research.

Further work is contemplated on the nutritive value of Minor Millets of India during the year 1931-32, for which the Indian Research Fund Association has allotted a further grant of Rs. 5,100 during the year 1931-32.

(2) "*Determination of Haemoglobin in Health and in Anaemias in Bombay.*"—The work on anæmias is now extended to the anæmia observed during pregnancy and after confinement. It is proposed first of all to find out if there is a so-called "Physiological" anæmia of pregnancy and, if so, to what extent and severity it is observed in cases which attend the ante-natal clinic.

(3) "*Maternal and Foetal Dystocia in Bombay.*"—This inquiry was undertaken in December 1929, with a view to ascertaining the shape and size of the Indian pelvis, the development of the Indian fœtus and the common types of dystocia in Bombay.

The enquiry is being continued in the year 1931-32, the Indian Research Fund Association having given a grant of Rs. 3,500 for the purpose.

Besides sanctioning the continuance of the above three enquiries, the Indian Research Fund Association has agreed to support three more enquiries, at these Institutions, as under :

(*i*) *Anthropometric Measurements in Bombay.*

(*ii*) *A systematic Survey of Bombay Dietary.*

(*iii*) *A study of protozoal parasites in vitro.*

Bengal Medical Institution.

The 7th anniversary ceremony of the Bengal Medical Institution and Hospital took place in the premises of the Institution early in Dec. 1931. The Secretary, in presenting the Annual Report acknowledged with grateful thanks a recent grant of Rs. 5000 from the Corporation of Calcutta a donation of Rs. 100 from the Indian Football Association, and of Rs. 225 from a kind-hearted donor, who preferred to remain anonymous.

The Out-door Hospital return showed an increase in attendance from 10,627 for the last year to 20,396 for the year under review. The students of the Institution are getting Hospital training in the Marwari Hindu Hospital.

The president, DR. J. N. MOITRA announced that SIR HARI SANKAR PAUL Kt. had presented on the occasion, an instrument to the Hospital which was worth Rs. 250 and that MR. S. N. SINHA, grand-son of SURYA NARAYAN SINHA of Bhagalpur, had promised a sum of Rs. 3000 in memory of his father. The President expressed satisfaction at the general management of the Institution and Hospital and requested the authorities to try to stand on their own legs as far as practicable. He assured the authorities that if they continued to work sincerely for the Institution as they had been doing the Corporation of Calcutta and other public bodies would not be lagging behind in rendering as much help as might be possible.

Medical Associations, Societies, etc.

Medical Societies, Associations, Unions etc. are invited to make use of this Section of the Journal. —EDITOR.

Indian Provincial Medical Services Association.

The following are extracts from the presidential address of DR. U. N. BRAHMACHARI M. A., M. D., PH. D., delivered at the thirteenth annual conference of the General Assembly of the Indian Provincial Medical Services Association, held on the 28th December, 1931, at Calcutta.

"It must be a matter of sincere satisfaction to us that more and more appointments are being thrown open to members of our Service for filling up higher "reserved" posts in the Medical Department. We sincerely thank the Minister-in-charge of Local Self-Government for this policy. It must be a matter of happiness to us that in a recent professorial appointment in the Medical College of Bengal, a member of our Service has been recruited.

"Our claims to demand better prospects and better position depend upon how we discharge our duties. It will be futile for us to say that because we belong to a particular service, we can claim as our right that higher appointments in the medical services under the Government should come to us, as a matter of course. Sooner or later, the law of survival of the fittest will decide such a problem and the legislature will demand that the best appointment should go to the best man irrespective of the fact whether he belongs to any particular service or not. I feel, therefore, most strongly that persons recruited to our Service should show high capabilities after entering into service. I warn you that unless this is achieved our Service is bound to go down.

"Gentlemen, I believe that a day will come when our work as researchers or as doctors in charges of hospitals and dispensaries will be of the highest order. When that day will come, then the realization of our claims and our struggles for better prospects will be made easy.

"Members of our Service must be given full facilities for higher appointments in the Medical Department. As officers whether in independent charge of hospitals as Civil Surgeons or as Assistant Surgeons our men have a long record of good service which has received the commendation of the Government and the public. Such good work must have its reward by giving them better prospects and position. We long for the day when the superior medical services in India will be unified and the best men by their energy and competence be able to occupy the high appointments in medical service that may be in the gift of the Government.

"Gentlemen, in these days of financial depression men of our Service will suffer severely, in addition to the "cuts" in their pay. They are suffering from loss of income for more reasons than one. Their pay is smaller than of those in other departments, their competition with the independent medical profession is increasing day by day, and people cannot seek as much medical help as they would require on account of their own financial difficulties. All these combined have set up a vicious circle which has peculiarly affected the men of our Service. We must submit to the inevitable till better times come.

"I am sorry to say that our financial position is not as good as it was last year. To some extent this is no doubt due to financial difficulties existing all over the world, but I am afraid it is also due to the apathy on the part of the members of our Service in joining our Association. Is it too much for me to hope that every member of the Provincial Medical Service should be member of our Association ?

"I now come to speak of our Journal. The publication of our Journal has been very regular and I think the contributions are of a much higher standard than in previous years. But I am sorry to find that while many contributions have been made by medical men who do not belong to our Service, the contributions of the latter are far below what was expected to them. This has been a subject of complaint from year to year and I therefore again appeal to all of you to try your best to improve the Journal by your contributions and help in getting more advertisements for your Journal from the different provinces to which you belong.

Malabar District Medical Association.

At a meeting of the Malabar District Medical Association held with DR. N. ACHUTHAN in the chair DR. V. JANAKI read a paper on "Maternity and Child Welfare". After it was over there was a lively discussion on the necessity of opening ante-natal clinics in the town and other means of improving the health of expectant mothers.. It was resolved to request the Municipality to open ante-natal clinics in all parts of the Municipality and to appoint lady health visitors.

Two cases of cancer which were treated in the hospital in vain but which DR. A. P. BALRAM successfully treated by internal administration of medicine were demonstrated at the meeting. With a few remarks from the chair the meeting came to a close.

After the meeting was over the Association was "At Home" to DR. JOSIAH JOSEPH, Chief Leprosy Officer of the Presidency. After refreshments a meeting was held DR. C. M. PHILIP, Assistant District Medical Officer, Malabar, presiding when DR. V. KRISHNA MENON spoke about the help and encouragement given by DR. JOSEPH to the Association.

The Burma Private Medical Practitioners' Association.

A meeting of medical practitioners in Rangoon under the auspices of the Burma Private Medical Practitioners' Association was held on 4th January 1932 DR. N. N. PARAKH presiding, for the purpose of discussing segregation and brothel areas in Rangoon.

After a discussion lasting over two hours in which DR. V. J. LOBO, DR. R. S. DUGAL, DR. B. SINGH, COLONEL BA KET, DR. A. J. M. MANI, DR. MA SAW SA and DR. BISWAS took part. On the motion of DR. DUGAL seconded by DR. LOBO, the following resolution was passed :

That this meeting of medical men of Rangoon while not approving of segregation resolves to point out to the Local Government the increasing prevalence of brothel houses in most parts of Rangoon and strongly urges the Government to take immediate steps to amend the Burma Suppression of Brothels Act, or so enforce its provisions as to eradicate the existence of brothel houses or minimise the nuisance in the city.

Association Notes

Central Council.

REPORT FOR THE YEAR ENDED DEC. 31, 1931.

In presenting the report for the year 1931 the Central Council have pleasure in recording a period of steady consolidation and healthy activity.

The efforts at consolidation are seen in the revision of the rules and the establishment of several branches and affiliated institutions ; while some of the main activities have centred round the Drugs Inquiry Committee and the Indian Medical Council Bill. On every important occasion the Association has amply justified its existence and proved the necessity of an India wide organisation that is able effectively to focus the attention of the independent medical profession of India on questions affecting their interests. The Association and its members are coming to be consulted more and more on all questions of importance to the profession and it is gratifying to find the important role played by the Association receiving increasing recognition on all sides. Growing realisation of this fact and what the association means to the medical profession in this country will lead to a wider sphere of influence and activity and give it a new accession of strength.

The year has not been without its anxieties. The developments in the political world have had their repercussions all round, and there is no doubt that in happier political circumstances we should have been able to record even greater progress. It will be remembered that DR. B. C. ROY, President of the Association in 1930 who was detained by Government was released only in March 1931 upon the signing of the Delhi Pact. Also for a large part of the year DR. JIVRAJ MEHTA who succeeded DR. B. C. ROY as President was away in England, having proceeded there as medical adviser to MAHATMA GANDHI. During his absence DR. B. C. ROY acted as President.

Council Meetings. Altogether six meetings were held during the year. The meetings were well attended, only 15 members attended less than half the number of meetings held during the year.

A sub-committee was formed to deal with the question of Vegetable Ghee which was referred to the Association for its opinion. The sub-committee consisted of :—Dr. A. C. UKIL (Convenor), DR. BENIMADHAB CHAKRAVERTTY, DR. B. C. GHOSH and DR. BANESWAR DAS.

Rules. The committee appointed at the 1930 All India Medical Conference to revise the rules duly submitted their recommendations.

Members. The year opened with 468 members on our rolls and closed with 548.

Branches and Affiliation. It is satisfactory to record the formation of branches in Multan, Jalgoan, Karachi, Patna, Bombay and Bengal. The following are now affiliated with the Indian Medical Association : Comilla Medical Association and the Jubbulpore Medical Association. We are certain that greater success would have attained our efforts had the Association been able to raise sufficient money to enable Col. BHOLA NAUTH, the General Organiser to conduct a tour in promising districts.

Noteworthy among the branches opened are those of Poona and Bengal whose reports indicate a laudable keenness and activity on the part of their members and office-bearers.

Propaganda. Wide use has been made of the general press to give publicity to the activities of the Association, but our main line of propaganda

is through the JOURNAL OF THE INDIAN MEDICAL ASSOCIATION (this is a name which was substituted for the "Indian Medical World" in September 1931). The position of this magazine has been affected by the general trade depression and the political situation, but its circulation has been well maintained. For its more efficient working a re-organisation of the Editorial Board was effected in the Poona Conference and the management placed on a more business like basis.

All India Medical Conference. It is usual for the All-India Medical Conference, which is held under the auspices of this Association, to take place about the Christmas holidays, but political events prevented the holding of the VII All India Medical Conference until 25, 26 and 27 April last. Also circumstances have compelled the holding of the Conference to be deferred till the end of February.

The VII Conference was held at Poona, in response to the invitation received from the Poona Branch. Its success was undisputed, it covered a wide field and was well attended and a number of scientific papers, some of outstanding merit, were submitted. As a report of this conference was published in the Indian Medical World of May 1931 and as particulars as to action taken on the resolutions adopted will be found in the *interim* report of the Central Council it would not serve any useful purpose in dealing with the proceedings of this Conference here.

The Indian Medical Council Bill. This has been the outstanding subject of the year. The danger of divided counsels on so important an issue was fully realised and the Central Council were specially strengthened by the addition of certain prominent members of the medical profession to deal with the question. The Council proceeded to gather opinions from all over India with a view to submitting an agreed representation and authoritative opinion to Government. Several meetings of the Council were held and as a result of protracted discussion a comprehensive draft of the recommendations has been submitted to Government.

The Drugs Inquiry Committee. It will be recalled that a sub-committee was formed at the All India Medical Conference to deal with matters arising out of the investigations of this committee. It submitted a somewhat lengthy report and DR. K. S. RAY gave evidence before the Committee on behalf of the Assoication.

Office. From 1st August, the office of the Association was transferred to 67, Dharmatalla Street, Calcutta. The new quarters have far more accommodation than the old quarters and provide a fairly large hall for meeting, lectures and social functions. The rent, Rs. 100 per mensem, is shared in equal proportion with the Bengal Branch and the Journal of the Indian Medical Association.

Acknowledgments. We have again to acknowledge the loyal support of all our workers, official, executive and staff, and to offer them our sincere thanks, in particular to MR. P. C. NANDI for auditing the account.

Amritsar Branch.

At a general meeting held on the 27th February, 1932 the following office bearers were elected for the year 1932.

President :—DR. DHANPAT RAI, Vice Principal, Medical School.

Vice President :—1 DR. GURANDITTA KAPUR Lecturer, Medical School.

2. DR. ROZDON, Health Officer.

Secretary :— DR. H. R. MADAN

Jt. Secretary :— DR. S. RAMSINGH

Treasurer :—DR. MOHD. MUNIR

Executive Committee :—LT. COL. PURI, MAJOR AMIR CHAND, MAJOR QUERESHI, CAPTAIN MANECK SHAW and DR. PARTAP SINGH.

Comilla Medical Association.

PROCEEDINGS OF THE ANNUAL GENERAL MEETING HELD on 21st February, 1932.

Members present :

1. Dr. P. S. Paul, M.B.
2. Dr. S. Das Gupta, B.Sc., M.B.
3. Dr. G. Ganguly, L.M.F.
4. Dr. S. P. Sen Gupta, B.Sc., M.B.
5. Dr. J. C. Deb Roy, B.Sc., M.B.
6. Dr. H. M. Guha, L.M.F.
7. Dr. M. Das Gupta, B.Sc., M.B.
8. Dr. K. K. Bardhan, L.M.P.

Dr. P. S. Paul was voted to the Chair.

1. The Secretary's report for the year ending December 1931 was read and placed before the meeting and was accepted.

2. The Account audited by DR. G. GANGULY was placed before the meeting and was accepted.

3. Election of Office-bearers for 1932.

President :—Dr. N. N. Bose, M.B.
Vice Presidents—Dr. H. M. Guha, L. M. F., Dr. M. Das Gupta, B.Sc., M.B.
Secretary—Dr. G. Ganguly, L.M.F.
Treasurer—Dr. J. C. Deb Roy, B.Sc., M.B.
Executives—Dr. P. S. Paul, M.B.
Dr. B. C. Paul, M. B.,
Dr. S. Das Gupta, B. Sc., M. B.
Dr. S. Ahmed, L. M. F.

Resolved that in the absence of DR. N. N. BOSE, DR. P. S. PAUL will act as the President of the Association and DR. S. P. SEN GUPTA as the Executive member in place of DR. P. S. PAUL.

4. The amount of the monthly subscription remains as before, namely Re. 1/- per month.

5. Delegate to the Annual Conference of the

Indian Medical Association to be held in March 1932 :

DR. S. P. SEN GUPTA who has very kindly volunteered, is elected to be the delegate of the Association.

Karachi Medical Association.

ANNUAL GENERAL MEETING.

The Annual General Meeting of the Karachi Medical Association was held in the Association premises on 17th January 1932 at 5 p. m. DR. G. T. WRENCH, M. D. presided.

The following members were present :

1. Dr. G. T. Wrench, M. D.—President
2. „ A. Said—Vice President
3. „ R. A. Amesur
4. „ C. P. Bhatt
5. „ C. A. Amesur
6. „ Mrs. Anna Thomas
7. „ B. L. Vora
8. „ D. H. Jhalla
9. „ K. H. Shah
10. „ R. H. Shukla
11. „ Hemandas. F.
12. „ K. V. Alwani
13. „ Kartarsingh Bedi
14. „ I. P. Bhatt
15. „ J. V. Braganza
16. „ M. B. Sipahimalani
17. „ Khiaram
18. „ V. P. Patel
19. „ N. V. Adalja
20. „ U. H. Sadarangani
21. „ Mrs. R. P. Narsian
22. „ K. P. Narsian
23. „ T. K. Uttamsingh.
24. Captain. S. S. Bhatnagar I. M. S.
25. „ A. K. Khan I. M. S.
26. Dr. Miss. E. Nunes
27. „ Naraindas

Guests :

1. Dr. H. L. Sakhuja.
2. „ G. T. Hingorani
3. „ E. D. Shroff.
4. „ Abdul Wahid
5. „ Major Cursetjee

The following business was transacted :—

1. The minutes of the last Annual General Meeting held on the 22nd Feb., 1931 were confirmed.

2. The annual report and the annual accounts as submitted by the Secretary were passed and adopted.

3. The Hony. Secretary read the revised Rules and Regulations with certain amendments for the consideration of the general body and drew the attention of the members particularly to the amendments and changes.

The revised Rules and Regulations with the changes and amendments were adopted and passed.

4. The following were made Honorary members.

(1) Health Officer, Karachi Municipality ; (2) The Civil Surgeon, Karachi ; (3) The Lady Physician, The Lady Dufferin Hospital, Karachi ; (4) The Deputy Director, Public Health, Karachi ; (5) The Port Health Officer, Karachi ; (6) The Superintending Officer in charge of the Government Health Laboratory, Karachi ; (7) The Officer Commanding, Indian Military Hospital, Karachi ; (8) The Chemical Analyser, Karachi ; (9) The A. D. M. S. Karachi Brigade, Karachi.

5. The letter dated the 1st. January, 1932 from Dr. V. P. PATEL proposing that the Association be registered under the Society Act XXI of 1860 as seconded by DR. C. P. BHATT was read After some discussion it was proposed from the chair that the letter be deferred at present and that the letter be placed before the Managing Committee for their consideration and if recommended, the letter be placed before the General Body for their consideration.

The proposal was carried unanimously.

6. The following were elected Office-bearers for 1932, or until such time their successors are elected.

President :—Dr. G. T. Wrench, M. D.

Vice President :—Dr. C. A. Amesur, M. B., M. S., D. L. O. (Lond), M. R. C. S. (Eng).

Honorary Secretary :—Dr. C. P. Bhatt, M. B., B. S.,

Honorary Jt. Secretary :—Dr. V. P. Patel, D. O. M. S. (Lond.) M. B., B. S. (Bomb.)

Honorary Treasurer :—Dr. Rochiram A. Amesur

Honorary Librarian :—Dr. A. Said

Honorary Auditor :—Dr. N. V. Adalja.

Members of the Managing Committee :—

(1) Dr. Miss E. Nunes L. M. & S.
(2) Dr. Mrs K. Tarabai L. C. P. & S., L. M. (Dub)
(3) Dr. D. H. Jhalla.
(4) Dr. T. K. Uttamsing, D. O. M. S. (Lond.)
(5) Dr. K. P. Narsian L. C. P. & S.
(6) Captain S. S. Bhatnagar, M. D., M. R. C. P. (Lond) I. M. S.
(7) Captain A. K. Khan M. B., M. R. C. S., F. R. C. S., I. M. S.

7. The following resolution was proposed and seconded by Captain. A. K. KHAN and Captain BHATNAGAR and was carried unanimously.

"That this Association offers its thanks to DR. A. SAID, a member of the Association for giving his premises with electric lights free of charge for the use of the Association.

8. The following resolution was proposed by DR. T. K. UTTAMSINGH and seconded by DR. G. T. WRENCH and was carried unanimously.

"That this Association offers its thanks and a vote of appreciation to DR. ROCHIRAM A. AMESUR the retiring Honorary Secretary for the work he did for the welfare of the Association and all he did for it throughout his tenure as Secretary. The Association places on record the services done to the Association by DR. ROCHIRAM with a high sense of appreciation and gratitude."

9. A vote of thanks from the chair to the retiring Honorary Treasurer and Honorary Auditor was carried with acclamation.

10. The President DR. G. T. WRENCH then in a short speech showed the importance of Unity of the Profession in Karachi and traced the history of the Karachi Medical Association and all the steps and moves for this unification. He was proud to tell the members that the Association has been recognised as the Sind Provincial Branch of the Indian Medical Association and that the efforts of the unification were in some way successful though not to the full extent, and hoped that in near future this unification will take place both for the sake of Profession and the medical fraternity's welfare and benefit.

He in his concluding remarks sincerely thanked all the guests present and all the members for their co-operation etc. A vote of thanks to the chair was carried with acclamation. The function then terminated with light refreshments.

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THE SEVENTH ANNUAL REPORT.

(Year ending 31st December 1931 as submitted by the Secretary.)

Membership: During the year under report 15 new members joined and 9 members resigned. The total number on roll on 31-12-31 was 42 resident members and 3 non-resident members.

Meetings: During the year under report 27 meetings of the General Body including the lecture meetings and 11 meetings of the Managing Committee were held.

Lectures: The following lectures were delivered by the members of the Association for which we thank them and hope that in future they will keep the Association lively with their lectures.

1. Modern Diagnosis and Treatment of Malaria by Captain S. S. BHATNAGAR M. D., M. R. C. P. (Lond.) I. M. S.

2. Headaches by DR. G. T. WRENCH, M. D.

3. Defects of sight and the importance of their accurate examination by DR. T. K. UTTAMSINGH, D. O. M. S., M. R. C. P. and S. (Eng).

4. Discussion of Whitlow by DR. C. A. AMESUR, D. L. O., M. B., B. S. (Lond), M. R. C. S. (Eng)

5. Gradentgo's Syndrome by DR. C. A. AMESUR, D. L. O., M. B., B. S. (Lond) M. R. C. S. (Eng).

6. Asthma by Captain S. S. BHATNAGAR, M. D., M. R. C. P. (Lond), I. M. S.,

7. Diphtheria with special reference to its Bacteriological Diagnosis and Immunization by DR. ROMEO DE SOUZA, M. B., B. S., L. R. C. P. (Lond) M. R. C. S. (Eng)

8. Diagnosis of the Enteric Group of Fevers by Captain S. S. BHATNAGAR M. D., M. R. C. P. (Lond) I. M. S.

9. Uses of Vaccines and Sera in General Practice by DR. N. V. ADALJA.

10. Cooking, Clothes and Customs as the Fundamental Causes of Disease by DR. G. T. WRENCH, M. D.

11. Discussion on Dieteries of Different Peoples and Communities by DR. G. T. WRENCH, M. D.,

12. Avertin in General Practice by Captain J. F. SHEPHERD, M. B., M. Ch. (Orth) I. M. S.

14. Investigation and Treatment of some of the important Urological affections in the Males, by Captain A. K. M. KHAN, M. B., M. R. C. S., F. R. C. S., I. M. S.

Finances: The year opened with an opening balance of Rs. 1057-11-0, (Rs. 1000/- as fixed deposit in the Karachi Urban Co-operative Bank and Rs. 57-11-0 in the Savings Bank Account) and closed with a balance of Rs. 1267-0-0 (Rs. 1000/- as fixed deposit, Rs. 60 interest on it and Rs. 207-0-0 as cash in hand).

Periodicals: The following periodicals were subscribed for the Association during the year and were circulated to the members.

1. The American Journal of Obstetrics and Gynecology.
2. The Indian Medical Gazette.
3. The Practitioner.
4. The Antiseptic.
5. The Dental Cosmos.
6. The British Medical Journal.
7. Transactions of the Ophthalmic Society of London.
8. Journal of the Indian Medical Association.
9. Calcutta Medical Journal.
10. Indian Journal of Medical Research.
11. The Medical Practitioner.

The Indian Medical Gazette is presented by DR. SAID to the Association for the use of the members.

It will not be out of place if we bring to the

notice of the members that the Association will be subscribing for the American Journal of Diseases of Children, Archives of Ophthalmology (in place of Transactions of the Ophthalmic Society of London) and the Journal of the Royal Society of Medicine, London for the year 1932.

The following books were sanctioned for the library but we regret to say that they were not ordered out at the time as the Association had deputed a delegate to Poona. We hope that we will be able to get them in the near future for the members.

1. Romani and Mitchiner: The Science and Practice of Surgery, Vol. I. and II.
2. Medical Drugs of India by R. S. Mohan.
3. Morley's Haemorrhoids.
4. The Manual of Tropical Diseases by Castellani and Chalmers.

The Honorary Secretary was deputed to attend the Indian Medical Association's Annual Conference at Poona to represent the views and interests of the Association and to impress the delegates who were attending the conference the necessity of including all medical men who are registrable on the Provincial Councils on the Indian Medical Register as otherwise it would be detrimental to the interests of the whole medical profession in particular and people of India in general. He successfully discharged the mandate given to him at the conference as will be seen from the proceedings of the Conference and also the attitude taken by the Indian Medical Association in trying to support the inclusion of all medical men who are qualified on the Indian Medical Register.

The important question of the year was the proposed Indian Medical Council Bill which affects the interests of the Indian Medical Profession as a whole. It is regrettable that the Government desires to hurry the bill up. A protest was lodged and we hope that more time will be allowed to consider the bill thoroughly.

You are all aware of the suggestions and the amendments submitted by the Association and we hope that due consideration will be given to them.

A move was made to have our Association recognised as the Provincial Branch of the Indian Medical Association for Sind and we are glad to inform you that the Association has been recognised as the Provincial Branch of the Indian Medical Association for Sind retaining its original designation. Now it lies with you to ratify and confirm the same. It will be necessary to make a few changes in the Rules and Regulations to adapt ourselves to the new change.

A strong protest was raised regarding the free use of the Civil Hospital Karachi by the well-to-do without paying requisite fees to the hospital and we are pleased to state that it was well responded to by the Surgeon General with the Government of Bombay.

We are proud to mention here that Dr. Rochiram A. Amesur, our Hon. Secretary was elected a member of the Bombay Medical Council. The Association is proud of his election and offers best congratulations on his success.

On behalf of the Association we sincerely thank Dr. A. Said our Vice President for his premises and lights free of cost for the use of the Association in addition to the Indian Medical Gazette.

Our sincere thanks to Dr. G. T. Wrench, M.D., our President for the keen interest he has taken in the working of the Association and we are thankful to him for his valuable guidance and help.

We also thank Dr. Adalja, the Hon. Treasurer and Dr. I. P. Bhatt, the Hon. Auditor for their help and co-operation.

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Current Medical Literature

Experience with the new local anaesthetic, Pantocain, in surface anaesthesia;

E. Theissing

Ztschr. Laryng. Rhinolog. Otolog. und ihre Grenzgebiete 1931, Bd. 21, H.5.

For several months, the author has successfully used Pantocain in every case of ear, nose and throat diseases, where formerly cocaine was employed. He administered a 2% solution with or without the addition of Suprarenin. He states that a 1% solution is not sufficient in every case. Usually 2 minims of Suprarenin were administered to each c. c. of a 2% solution. Pantocain produces a slight anaemia of the field, which seems to be of definite advantage over Percain, which produces hyperaemia. Consequently, in surface anaesthesia, Pantocain can also be used

without the addition of Suprarenin. In all cases the results were equally effective, as compared to those achieved with a 10% cocaine solution. By-effects were never observed, not even in children. *O. U.*

The Treatment of Hemicrania with the Hormone of the anterior lobe of pituitary gland

KLAUSNER CRONHEIM.

Deutsche Mediz. Wochsch. 1931, No. 34, p, 1455.

As attacks of hemicrania usually disappear during pregnancy, but reappear after the termination of the condition, the authors conclude that deficiency of anterior lobe hormone of the pituitary gland, the latter being present in large quantities in circulation, during pregnancy, could well be made responsible for it. Accordingly, they treated 10 cases of hemicrania by giving 1 tablet of Prolan, twice daily. There were 3 failures, but in 7 cases the results were very satisfactory. The attacks were either diminished in strength or disappeared entirely. However, an increase in menstrual flow usually followed, and in one case of 48 years-old woman, who had entered menopause, metrorrhagia took place. The authors conclude that the Prolan fraction A, but not the Prolan fraction B, works as antispasmodic and consequently against hemicrania. *O. U.*

The Control of Avertin Narcosis.

H. KILLIAN.

Klin. Wschr. 1231, No. 31, p. 1446.

The author examined various possibilities to wake up patients from the sleep after Avertin narcosis and employed therefor cardiazol, coramin, hexeton, camphor, ephedrin, lobelin and thyroxin. It was shown that ephedrin and thyroxin are without any effect whatsoever. Camphor again showed only its well-known effects upon the respiration, and nothing more. A very good influence upon the respiration was however, shown by hexeton and cardiazol, but the depth of the sleep was not so markedly influenced as with coramin. How coramin brings about the termination of the narcosis is, however, not yet clear. Coramin can be mixed with Avertin, as it does not react with the narcotic drug itself. Toxic-effects have never been observed. The lethal dose for coramin for an adult would be 1 oz. of the 10% substance, whereas the usual solution and ampoules which are available for the trade, contains only 25% However, 1/3 oz. of the 25% solution was usually sufficient to reduce the slumber after Avertin narcosis, according to the requirements of the physician. In emergency cases, the intravenous injection of coramin (once or twice $2^1/_2$—5 c.c. of the 25% solution) is clearly indicated, and the action sets in very promptly. In ordinary cases, where, according to the impression of the physician, the post-narcotic sleep has lasted too long, an intramuscular injection of 3 c. c. of the 50% solution may be safely relied upon. *O. U.*

Avertin and the treatment of its effects.

E. DOMANIG.

(Vienna Clin. Wschr. 1931, No. 36, p. 1129).

The systematic employment of drugs like camphor, cardiazol, lobelin, hexeton, thyroxin and coramin, which influence respiration and circulation in cases of Avertin narcosis, gave more or less the same results, as found by KILLIAN. The author observed, however, best results with higher doses of coramin, confirming thereby the previous experiments of KILLIAN and MOERL. Whereas small doses of this drug (2·2. c. c.) intravenously did not show any appreciable result, the author observed excellent results without any by-effects whatever with doses between 6—8 c. c. of the 25% solution, intravenously. However, the after-sleep is not appreciably decreased. Intramuscular injection of coramin does not give such a quick result; the effect, however, lasts longer than that after intravenous injections, where the effect usually disappears after 10 to 15 minutes. In rabbits, it was possible to delay the fatal issue of the lethal Avertin dose (0·6 gm. per kilo bodyweight per rectum) with coramin (1—2 c. c. intravenously every hour), but the same could not be altogether avoided. Through simultaneous administration of coramin (1 c. c.) with soporific dose of Avertin (0·05 gm. per kilo bodyweight), it was possible to prevent the sleep altogether. However, although the results were quite satisfactory generally, the author gives warning against becoming too optimistic with regard to this drug in Avertin narcosis in case of human subjects.

In cases of rapid fall of blood pressure due to shock, during Avertin narcosis, the author employed ephedrin, ephetonin and racedrin with equally good results; the blood-pressure being increased by 20 to 60 mm. Hg. *O. U.*

The Erythrocyte Sedimentation Rate in Kala-azar.

L. E. NAPIER AND J. M. HENDERSON.

Ind. Jour. Med. Res. XIIX 2. Oct. 31, p 691.

The authors conclude from a series of sedimentation tests in Kala-azar that though the sedimentation rate is greater in Kala-azar than in any other disease, the estimation of this rate is unlikely to prove a measure of any diagnostic and prognostic value. *J. N. Dutt.*

Comparative Vitamin B. values of foodstuffs, fruits and vegetables.

PLIMMER, RAYMOND AND LOWNDES.

Bio-chemical Journal. Vol. xxv 5, 1931 p. 1788.

The tests on the Vitamin B. values of fruits and vegetables were made on pairs of pigeons.

In no case could the pigeons be maintained with the fruit composing 50% of the diet. With 70% of the diet composed of fruit maintenance of the pigeons was not longer than from 9 to 11 weeks except with orange juice and orange peel. The maintenance with orange peel was remarkable. In general, vegetable leaves have a better vitamin B. value than vegetable roots and fruits. Of the roots and tubers tested, artichokes, leeks, parsnips and potatoes contain some vitamin B, beetroot, carrots, swedes and turnips contain very little. The authors report that in comparison with cereals, and pulses, fresh fruits and vegetables have a much lower vitamin B. value. *J. N. Dutt.*

Metabolic studies in Addison's disease. The effect of treatment with the cortical hormone of the suprarenal gland.

GREENE, ROWNTREE, SWINGLE AND PFIFFNER.

Amer. Jour. Med. Sc. Jan. 1932.

Vol. CLXXXIII No. 1. p. 1.

The authors studied the chemical and metabolic changes observed in cases of Addison's disease and the effect on these changes of treatment with the cortical hormone of the suprarenal gland prepared by the method of SWINGLE and PFIFFNER.

The clinical course of Addison's disease may arbitrarily be divided into three stages of initial destruction of the suprarenal glands (2) The stage of the recognisable clinical syndrome, and (3) the terminal stage or crisis.

Usually the disease in not recognisable until the second stage is reached. At this time there may be loss of weight, asthenia and definite under nutrition. The basal metabolic rate is slightly reduced and there is some reduction in blood sugar. Such changes become less with treatment and more marked in the periods of crisis.

The quantities of the various constituents of the urine in Addison's disease corresponded to the lower levels of the usually accepted normal standards. Creatinuria was present in a considerable number of cases. Retention of practically all urinary constituents was noted in one case in the course of a period of diminished urinary output. The nitrogen balance of those patients who were losing weight was negative. The majority of patients gained weight as a result of treatment with the suprarenal cortical hormone. In such cases the nitrogen balance became markedly positive.

The period of crisis was characterised by gastro-intestinal upsets, nausea and vomiting, pains, circulatory collapse, low blood pressure, dehydration and renal insufficiency. *J. N. Dutt.*

The Electrocardiographic diagnosis of coronary occlusion by the use of chest leads.

WOLFERTH AND WOOD.

Jour. Am. Med. Sc. Vol. CLXXXIII No. 1 p. 30.

The authors report two cases to illustrate the use of Lead IV (an anteroposterior chest lead) in the electrocordiographic diognosis of coronary occlusion. In one case the three conventional electrocardiographic leads yielded little or no diagnostic information except on the fourth day. Nevertheless for eight days after the original infarction Lead IV showed striking and unmistakable deviation of the S-T interval from the isoelectric line. In the second case both leads I and IV showed evidence of coronary occlusion and Lead IV showing more strikingly than Lead I. The authors suggest the employment of leads will add materially to the usefulness of the electrocardiograph. *J. N. Dutt.*

The Etiology, Prognosis and Treatment of Auricular fibrillation

STROND, LAPLACE AND REISINGER.

Jour. Am. Med. Soc. Vol. CLXXXIII No. 1, pp. 48.

The subject of auricular fibrillation has occupied the attention of many notable workers since its common incidence was noted by ROTHBERGER and WINTEBERG and by LEWIS.

The authors in a series of 253 cases of chronic auricular fibrillation have endeavoured to determine (1) the principal etiologic factors (2) the prognosis on a basis of etiology, age and extent of cardiac damage (3) the comparative merits of treatment with digitalis and quinidine.

Throughout the series no common etiologic factors have become apparent. The authors express that the presence of auricular fibrillation does not necessarily imply a worse prognosis than in the non-fibrillating heart with an equal amount of cardiovascular damage. The prognosis is very poor in patients developing fibrillation before the age of 25 years.

Fibrillation associated with thyrotoxicosis will usually terminate spontaneously following partial thyroidectomy, and if not, almost invariably will respond promptly to quinidine therapy after such an operation.

Syphilitic cardiovascular disease is comparatively rarely associated with auricular fibrillation. In the treatment of patients with auricular fibrillation digitalis usually proves most satisfactory. It is only in the exceptional case that a restoration to normal rhythm by quinidine sulphate is of more apparent value to the patient than the establishment of a daily maintenance dose of digitalis. Although there appears to be little danger of accident from the use of quinidine

sulphate in properly selected cases of auricular fibrillation yet the authors suggest that this drug should only be used in those few cases of younger individuals with slight or no demonstrable cardiovascular abnormality except the arrhythmia or in thyrotoxic patients following partial thyroidectomy without a spontaneous return to normal sinus rhythm. *J. N. Dutt*

The Occurrence of Pyruvic acid and Methylglyoxal in Muscle Metabolism.

CASE AND COOK.

Biochemical Journal Vol XXV. No. 4 p. 1319.

The authors carried out an experiment to study the intermediary mechanisms of muscle carbohydrate metabolism. They used reagents which removed from the system some product which is only transitorily formed normally. They utilised sodium sulphite as a fixate. Pyruvic acid and methylglyoxal have been shown to occur in frog and rabbit muscle both in the presence and absence of sulphite and under both aerobic and anaerobic conditions. These substances have been isolated and identified as the 2 : 4 dinitrophenyl hydrazone and osazone respectively.

In view of the conditions in which these compounds appear the authors suggest that they are intermediary between carbohydrate and lactic acid. *J. N. Dutt.*

The Chlorides and Inorganic Constituents of the Serum and Cerebrospinal Fluid in Nephritis and Acidosis.

LINDER AND CARMICHAEL.

Biochemical Journal Vol. XXV No. 4. p. 1090.

In view of the constant relationship of the chlorides of the blood serum in normal conditions and in meningitis they studied the condition in nephritis and in ammonium choloride acidosis. They report that in moderate disturbance of acid base balance due to nephritis and ammonium chloride therapy the normal relationship remain intact. They found in one case of severe nephritis that cerebrospinal fluid chloride was considerably higher than was compatible with serum chloride. In another case cerebrospinal fluid carbonate was considerably less than was to be expected from serum carbonate. The authors are of opinion that these observations give the key to the situation in those cases of uraemia in which very high cerebrospinal fluid choloride have been reported and explain why such high cerebrospinal fluid chlorides are of evil prognosis. *J. N. Dutt*

Renal Dwarfisin and Rickets.

SCHLESINGER

Proc Roy. Sec. Med. Vol XXV
No. 1 p. 10 Nov. 1931.

Boy aged 7 years. Past history : breast fed at 10 months : right foot was noticed to be turned in and patient was treated for rickets with cod liver oil and artificial sunlight without any improvement. Albuminuria was first noticed at the age of 4 years. Deformities progressed and child began to complain of thirst and polyuria.

Present condition : Height 37 inches ; weight 32 lbs. Marked genu valgum and rachitic enlargement of epiphyses of arms and legs. B. P. 108 mm ; urine, sp. gr. 1015, albuminuria. Microscope—nothing abnormal ; blood urea 36 mg % serum Cal 9·7 mgm ; inorganic phosphorus 1·7 mgm ; cholesterol 155 mgm ; urea concentration 1·5 % 1·8%, 2·3% in three hours respectively W. R. negative ; skiagram marked evidence of active rickets in the upper and lower extremities.

Discussion—W. W. PAYNE said that he had two undeniable cases of renal rickets with a very high bloodurea content. In both these calcium was normal and phosphorus was 2·8 mgm and 3·8 mgm. respectively. He had not had a case of renal rickets with high phosphorus content. The bony changes occurred later than in ordinary rickets. LEONARD FINDLAY said that posibly in this case there was nephritis, in view of the persistent albuminuria and the record on one occasion of a high blood urea. The dwarfing of the patient strongly suggested renal disease but the x'ray appearances were just as were met with in ordinary late rickets. He suggested there might have been rickets at the age of ten months and healing might quite well have occurred and the present mischief be of the nature of a recrudescence. In chronic renal disease there was a prolonged deprivation of calcium leading to a condition of osteoporosis. He suggested that in chronic renal disease there occurred this prolonged calcium starvation rendering the patient liable to rickets. As chronic nephritis was an incurable and progressive disease one was therefore not surprised that therapeutic measures were of no avail. SCHLESINGER said that he considered this to be a case of renal rickets. Ordinary rickets could be excluded because the diet during the last 4 or 5 years had been antirachitic and yet the condition gradually advanced. Ordinary rickets were cured by means of ultraviolet light or by supplying deficient vitamins ; renal rickets, on the otherhand, remained unaffected even ultraviolet might prove dangerous. It is important to keep a watch on blood urea if this treatment were attempted. *J. N. Dutt.*